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Report of the Board of Auditors

for the year ended 31 December 2015

Volume V
Capital master plan

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Note

Symbols of United Nations documents are composed of letters combined with figures. Mention of such a symbol indicates a reference to a United Nations document.

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Contents

		Page
	Letter of transmittal	4
	Capital master plan: key facts	5
	Summary	6
	A. Background	10
	B. Financial status of the project	11
	C. Project schedule and scope	20
	D. Managing the campus	27
	E. Maximizing the benefits of the renovated campus	31
	F. Acknowledgement	35
Annexes		
I.	Lessons from the capital master plan	36
II.	Timeline of key events in the capital master plan as at March 2016	73
III.	Status of implementation of recommendations	74

Letter of transmittal

Letter dated 30 June 2016 from the Chair of the Board of Auditors addressed to the President of the General Assembly

I have the honour to transmit to you the report of the Board of Auditors on the capital master plan for the year ended 31 December 2015.

(*Signed*) Mussa Juma **Assad**
Controller and Auditor General of the United Republic of Tanzania
Chair of the Board of Auditors

Capital master plan: key facts

Cost

$2,310 million	Anticipated final cost of the capital master plan
$45 million	Estimated cost of remaining scope to be completed by December 2016

Scope

Secretariat Building	Completed in May 2015
General Assembly Building	Substantially completed and handed over in September 2014
Conference Building	Substantially completed in February 2013
Library and South Annex Buildings	Removed from scope of capital master plan in 2015

Summary

Background

1. The capital master plan, a complex, high-value project to modernize and improve the operating efficiency of the United Nations Headquarters buildings without compromising day-to-day operations, is coming to a close. The General Assembly approved the project in 2002 with an initial budget of $1.877 billion and an expected delivery date of November 2013. The main buildings were substantially complete in September 2014 and have been reoccupied by United Nations staff; responsibility for the operation and maintenance of the campus has been transferred to the Administration. The anticipated final cost of the project is now $2,310 million, and construction work is expected to be completed by December 2016. Final administrative closure of the project and all related contacts is expected to follow in 2017.

2. Over its lifetime, the project has suffered unforeseen cost increases owing to such factors as the need to remove large amounts of asbestos from the buildings, the introduction of more stringent and costly security requirements and the damaging impact of Storm Sandy. In its reports, the Board has drawn attention to significant shortcomings in project management and cost control and has drawn together a number of lessons to be learned from the project (see **annex I**). Owing to insurmountable difficulties in meeting security requirements, the planned refurbishment and modernization of the Library and South Annex Buildings was removed from the scope of the project.

3. Major benefits expected from the investment included a more modern, energy-efficient, safe and accessible working environment. A chronology of key events over the project's lifetime is contained in **annex II**.

Scope of the report

4. In its resolution 57/292, the General Assembly requested an annual report from the Board of Auditors on the capital master plan. This thirteenth annual Board report on the project assesses the project's status as at 31 March 2016. The present report focuses on:

- Financial status (see sect. B);
- Project schedule and scope (see sect. C);
- Managing the campus (see sect. D);
- Maximizing the benefits of the renovated campus (see sect. E).

5. The audit was performed in two phases: an interim progress update in December 2015 and a final audit in March 2016. Audit information requests were communicated in advance of each audit, but the Administration was unable to provide sufficient evidence in some areas. The present report therefore has been prepared on the basis of the information available at the time of audit.

Key findings

Financial status

6. **The Administration is committed to completing the project within existing resources and the Board considers this to be achievable.** In its resolution 70/239, the General Assembly requested the Secretary-General to ensure that the costs of the remaining activities would be met from the existing resources of the capital master plan project. The Board considers that sufficient savings can be released from existing contracts during the closure process to enable the completion of the project within existing resources. Under current arrangements, however, it is not possible to track how the savings are applied, as there is insufficient transparency in the reporting of their use.

7. **The main risks to completing the remaining project activities within the anticipated final cost relate to the delayed closure of contracts and the associated need to control the costs of consultancy support.** As at March 2016, the programme management consultancy contract had been amended 36 times, extending the end date from December 2011 to December 2016 and increasing the total not-to-exceed value from $15.9 million to $59.0 million. Owing to the high dependency on expert consultants, it is probable that consultancy support will also be required in 2017, further increasing these costs. The Administration also breached procurement rules during its extensions to contracts for consultancy support in 2015, which it has since rectified.

8. **The main contractor has filed a notice of arbitration against the United Nations seeking indemnification in the event it is required to settle substantial claims from its subcontractors. The Administration considers that it has no liability in respect of this claim and that any action against the United Nations would not succeed.** In the event that any claims against the United Nations were upheld, the final project cost would increase, as no provision exists for such claims in the budget. The Administration has retained external legal counsel to defend its interests in the dispute between the contractors. The Administration is unable to predict the timing and outcome of these unresolved arbitrations with any level of certainty.

Project schedule and scope

9. **The revised plan to complete the main construction works proved unrealistic and the reintroduction of earlier project management disciplines is required.** The smaller project team and the reduced number of expert personnel, exacerbated by the additional workload arising from the implementation of Umoja, resulted in a reduced level of project management disciplines and oversight in 2015. An up-to-date consolidated project plan could not be provided for audit; risk registers had not been updated; and key management reports previously available from the Office of the Capital Master Plan, such as monthly cost reports, were also unavailable. The Administration also revised its procurement strategy for completing the service drive works, which reduced the planned level of competition for the contracts while increasing the overall cost.

10. **Owing in part to the ongoing dispute between the main contractor and the subcontractor, the Administration is unlikely to achieve the administrative closure of the project until 2017. All residual construction works, including**

demolition of the North Lawn Building, works on service entrances and landscaping, should be completed by December 2016. As at March 2016, the basements, the General Assembly Building and the Conference Building, although fully occupied, had not obtained final certification. In total, 10 guaranteed maximum price contracts remained open, and a significant number of subcontracts were still to be finalized and paid in full. Prior to its closure in July 2015, the Office of the Capital Master Plan expected all of those tasks to be completed by October 2015. That was not achieved, and the project is now expected to be closed in 2017. At the time of reporting, the demolition of the North Lawn Building, landscaping works and major works on the service entrances at 42nd and 48th Streets were under way and on target for completion in 2016.

11. **There has been no progress in developing new proposals to renovate the Library and South Annex Buildings, which were removed from the scope of the capital master plan in 2015.** The Administration has informed the Board that comprehensive proposals will only be prepared once the General Assembly makes a decision on the question of long-term accommodation in New York. Interim solutions introduced at a cost of $13 million are in place and were met from within the budget.

Managing the campus

12. **The transition from the construction phase to managing day-to-day operations has occurred and the campus is operating effectively.** Although there are around 20,000 service requests to the Facilities Management Service help desk each year, most of them are routine and there have been no major complaints, critical incidents or disruptions to operations. In 2017, the Administration intends to commission a specialist firm to review its approach to maintaining the renovated campus. This will provide an opportunity to assess the balance between outsourcing and in-house provision to ensure the best use of resources. An agreed long-term maintenance plan for the campus is not yet in place.

Maximizing the benefits of the renovated campus

13. **The Administration has not yet assessed whether the renovated campus has achieved its energy efficiency targets, but this appears likely.** The energy and water supplies to the North Lawn Building were terminated in January 2016, and the new environmental reporting system will be online in April 2016. Therefore, the Administration will be in a position to demonstrate benefits from energy efficiency in 2017, using 12 months of utility bills data in January 2017 and 12 months of data from the environmental reporting system in April 2017.

14. **The Administration plans to optimize the use of the renovated campus by introducing flexible workplace.** Making the best use of the office space available in the renovated campus will increase the return on the significant investment made by Member States. The Administration accepts that space could be used more efficiently across Headquarters, and has proposed to accommodate 800 extra staff in the Secretariat Building. Notwithstanding recent increases in the projected costs of implementation, flexible workplace still provides a compelling business case for Member States to consider and offers a payback period of around five years. The strong resistance displayed by some senior managers undermines the project and could increase accommodation costs significantly.

Overall conclusion

15. The capital master plan is in its final phase after nearly 14 years and an investment of $2.3 billion. All major procurement actions are finalized, major construction works are complete, residual works are in progress and the administrative close-out of completed contracts continues. The impact of unforeseen events and a history of inaccurate cost estimates have contributed to significant cost and time overruns over the life of the project, but the Administration should complete the remaining activities within budget by 31 December 2016. The date for final completion and the administrative close-out of the capital master plan is less certain, and is likely to take place in 2017.

16. The Administration needs to manage the residual risks around the project and maintain project management disciplines to ensure that it is completed smoothly within the current timetable and budget. In particular, the Administration should maintain close control of consultancy and other costs, prioritize its efforts to realize the full benefits of investments by Member States in the capital master plan and ensure that it has credible maintenance plans in place to preserve the full value of the significant investment in the campus.

Recommendations

17. **The Board recommends that the Administration:**

(a) **Strengthen the approach to managing the project to completion in 2017 by: (a) updating the anticipated final cost of each subproject; (b) updating the project plan to include all key milestones, project activities and resource requirements; and (c) updating the costed risk register to reflect the current stage of the project;**

(b) **Apply newly developed project management guidelines of the Office of Central Support Services to provide assurance over the adequacy of current project management arrangements for the capital master plan;**

(c) **Focus on realizing the full potential benefits from the investment made in the capital master plan and ensure that optimal use is made of the new modern working environment to reduce the use of costly rented accommodation;**

(d) **Perform a detailed analysis of operational data and building malfunctions to help it to develop a strong business case for submission to the General Assembly in support of its proposed annual and longer term maintenance budgets;**

(e) **Present a preliminary analysis of utilities data following the closure of the North Lawn Building to the General Assembly during the main part of its seventy-first session and a full year of data, ready for audit, during the resumed part of the session.**

18. The Administration accepted all of the Board's recommendations.

A. Background

The project and its objectives

1. The capital master plan is a complex, high-value project to modernize, secure and preserve the United Nations Headquarters campus in New York without compromising day-to-day operations. The approved scope of the project included:

- Renovating five major buildings as well as the extensive basement complex;
- Constructing a temporary secure building on the North Lawn to house certain activities normally carried out in the General Assembly Building, the Conference Building and the Secretariat Building during their renovation, and demolishing it after the completion of their renovation;
- Transferring staff to and back from temporary office space across New York City, involving more than 10,000 staff moves.

2. The expected project outcomes (see A/55/117) were a headquarters campus that:

- Is energy-efficient, free of hazardous materials and compliant with the building, fire and safety codes of the host city;
- Provides full accessibility to all persons;
- Meets all reasonable, modern-day security requirements;
- Preserves the original architecture to the greatest extent possible.

3. The General Assembly approved the original aims of the project in 2002 (see resolution 57/292) and the original budget of $1,877 million in 2006 (see resolution 61/251). In 2007, an accelerated strategy was adopted, which increased costs but reduced the period of renovation to minimize disruption to United Nations operations. In March 2015, the Library and South Annex Buildings were formally removed from the scope of the project (see resolution 69/274 A) owing to financial and security concerns.

4. The Under-Secretary-General for Management is the senior responsible owner of the project. In 2003, the United Nations established the Office of the Capital Master Plan to manage the delivery of the project, working with other parts of the Administration.

Developments since the Board last reported

5. Since the Board last reported:

- The anticipated final cost of the project has remained largely unchanged at $2,310 million;
- The Office of the Capital Master Plan closed on 31 July 2015, one month later than planned. An integrated project team of 8 United Nations staff and 20 programme management consultants was transferred to the Office of Central Support Services to administratively close out the remaining contracts of the main contractor and manage the remaining capital works;

- Demolition of the North Lawn Building began in January 2016 and is expected to be complete by May 2016. Associated landscaping work has also begun and is due to be completed by November 2016;
- Procurement actions for the works at 42nd and 48th Streets were complete by March 2016 and the related works are expected to be completed by December 2016;
- Interim solutions to relocate functions formerly hosted in the Library and South Annex Buildings, including catering facilities and related works, were completed by April 2016.

Previous recommendations

6. Of the 11 outstanding recommendations contained in the Board's previous reports, all of which the Administration accepted, 3 (27 per cent) have been implemented, 4 (37 per cent) are under implementation, 3 (27 per cent) have not been implemented and 1 (9 per cent) has been closed by the Board and superseded by a recommendation in paragraph 17 (a) of the summary (see **table 1**). **Annex III** summarizes the action taken in response to the Board's previous recommendations in more detail.

Table 1
Status of implementation of recommendations

	Fully implemented	*Under implementation*	*Not implemented*	*Overtaken by events*	*Closed by the Board*
Total	**3**	**4**	**3**	**0**	**1**
Percentage	27	37	27	0	9

Source: Board of Auditors.

7. Over the past three bienniums, the Board has made 42 recommendations intended to improve the management and governance of the project. The Administration has responded positively to some of the recommendations, but in a number of areas has made limited progress, although we note that more recently the Office of Central Support Services has made efforts to ensure that these recommendations are applied to other capital projects.

B. Financial status of the project

8. Section B provides an update on the project's financial position as at March 2016. **Table 2** shows the current projected costs of the capital master plan compared with the approved budget and the Board's calculation of the total cost overruns. With $45 million of further expenditure required to complete construction works, the capital master plan is now in its final phase. The anticipated final cost of construction works is $2,150 million. Although the project is in its final phase and remains on target for completion by December 2016, significant changes to detailed cost estimates and slippage in the completion of project activities continue to occur.

Table 2
Estimated final costs versus budget as at March 2016
(Thousands of United States dollars)

	Project (construction) costs[a]	*Associated costs*	*Secondary data centre*	*Total budget and costs*
Approved budget	1 876 700			
Donations	14 322			
Enhanced security upgrade	100 000			
Contribution to secondary data centre			4 228	
Consolidated budget	**1 991 022**		**4 228**	**1 995 250**
Anticipated final costs	2 050 383			
Enhanced security upgrade	100 000			
Associated costs		139 747		
Secondary data centre			19 393	
Total anticipated final cost	**2 150 383**	**139 747**	**19 393**	**2 309 523**
Projected cost overrun	**159 361**	**139 747**	**15 165**	**314 273**
Percentage over consolidated budget	8%		359%	16%

Source: Administration's data.

[a] Construction costs do not include the $65 million estimated cost to renovate the Library and South Annex Buildings.

Budget

9. The consolidated budget of $1,995 million is unchanged, of which $1,991 million relates to the main construction project and $4 million to the secondary data centre. Associated costs, such as increased security requirements, were not identified at the outset, and although they were authorized by the General Assembly, they had no assigned budget. The Administration also reports a small increase of $410,000 in voluntary donations from a Member State and a matching increase in expenditure.

Cost overruns

10. The causes of the $159.36 million (8 per cent) construction cost overrun occurred in earlier periods. As reported in detail in previous Board reports, the cost overrun related primarily to changes in the construction strategy resulting in increased professional fees, higher swing space costs and unforeseen events, such as revised and more costly security standards and the damaging impact of Storm Sandy. The project also has a history of inaccurate cost estimates.

11. The anticipated final construction cost excludes work originally planned for the Library and South Annex Buildings at an estimated cost of $65 million, which was removed from the scope of the project in March 2015. The anticipated final cost for construction is therefore the cost of delivering a reduced scope (the renovation of three buildings instead of five) at a higher cost than originally planned. Overall,

including expenditure on associated costs, the Board calculates total cost overruns of $314.27 million, equivalent to 16 per cent of the total consolidated budget.

(a) Cost of the works of the main contractor

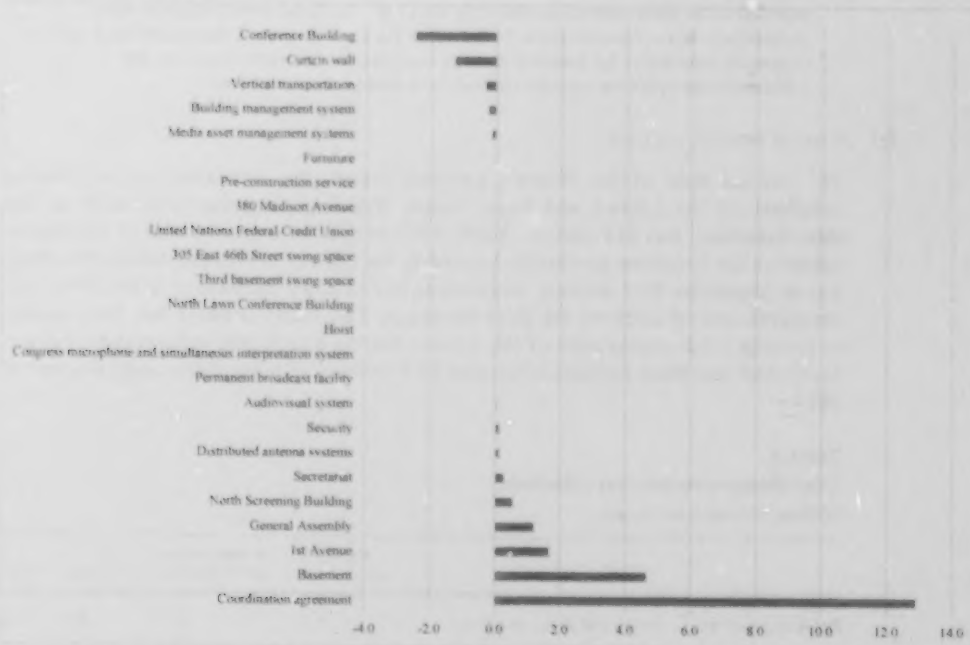
12. The reported anticipated final cost for the works of the main contractor has increased by over $17 million since the Board last reported. In June 2015, the Administration estimated the total cost of all 24 guaranteed maximum price contracts to be $1,687 million. In March 2016, it estimated the total cost to be $1,704 million. **Figure I** shows that the main increases are $12.9 million for the coordination agreement, which now includes a provision for the works at 42nd Street, and for $4.7 million of works in the basements.

13. The Administration has subsequently informed the Board that, since the audit, the estimated anticipated final cost of the 24 guaranteed maximum price contracts has fallen to $1,700 million.

Figure I

Changes to anticipated final costs of contracts (June 2015 to March 2016)

(Millions of United States dollars)



Source: Board analysis of the Administration's data.

(b) Cost of residual works

14. Although the anticipated final cost of the project is unchanged, **table 3** shows that there continues to be significant volatility within cost estimates. The estimated cost of residual capital works has increased by $1.1 million to $36.2 million since the Board's previous report. The $2.1 million increase for works at 42nd and 48th

Streets is due mainly to a change in the procurement approach which involved paying the main contractor a premium of approximately $1.5 million to take over responsibility for managing the works at 42nd Street from the Office of Central Support Services (see sect. C). Savings of $2.8 million are likely, as the winning bid for the demolition of the North Lawn Building and for landscaping works was $16.8 million, compared with the revised estimate of $19.4 million.

Table 3
Estimated cost of residual capital works
(Millions of United States dollars)

	Estimated cost in June 2015	*Estimated cost in March 2016*	*Change*
Service drive works at 42nd and 48th Streets[a]	14.7	16.8	+2.1
Demolition of North Lawn Building and landscaping[b]	20.4	19.4	-1.0
Total	**35.1**	**36.2**	**+1.1**

Source: Administration's data.

[a] Originally to be procured competitively as a single contract, the works at 42nd Street were awarded to the main contractor, while the works at 48th Street were subject to open competition. Both contracts are to be delivered for a not-to-exceed amount of $16.8 million.

[b] Originally intended to be managed through two separate contracts; however, the Administration opted for a single contract to reduce procurement time.

(c) Cost of interim solutions

15. At the time of the Board's previous report, the estimated cost of interim solutions for the Library and South Annex Buildings, together with work on the third basement, was $14 million. **Table 4** shows that the expected cost of the interim solutions for functions previously located in the Library and South Annex Buildings has decreased by $1.5 million, while there has been an increase of $100,000 in the estimated cost of work on the third basement. The Administration has been unable to provide a full explanation of the reasons for the significant underspends, but has confirmed that there remains a forecast $5.1 million of expenditure until December 2016.

Table 4
Cost changes to interim solutions
(Millions of United States dollars)

	Estimated cost in 2015	*Estimated cost in March 2016*	*Change*	*Status as at March 2016*
Relocation of South Annex cafeteria functions	5.0	4.3	-0.7	Completed
Limited renovation of the Library Building	4.0	3.1	-0.9	Completed
Fit-out of the third basement of the North Lawn Extension Building	5.0	5.1[a]	+0.1	Under construction
Total	**14.0**	**12.5**	**-1.5**	

Source: Administration's data.

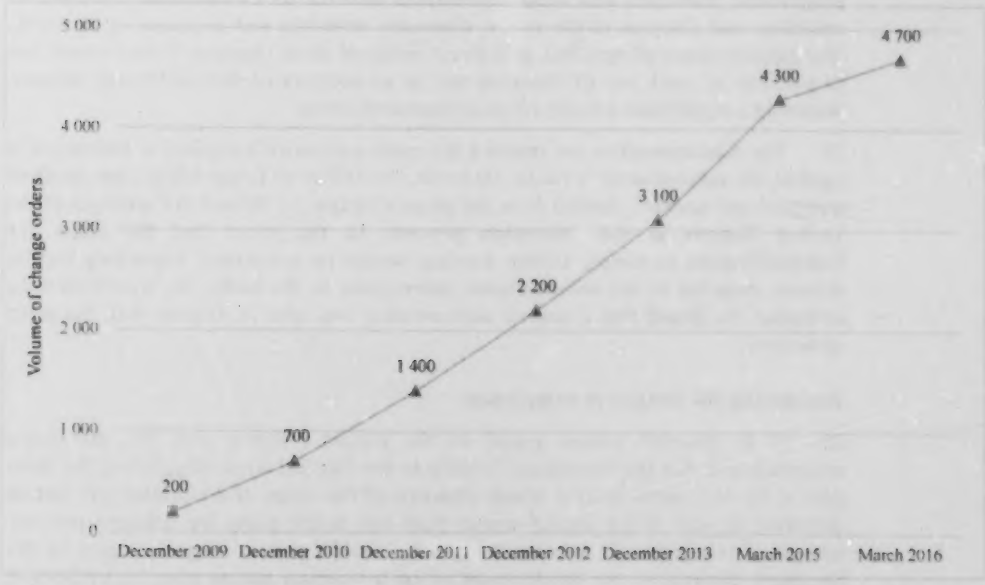
[a] Costs in 2016 for the North Lawn Extension Building are a forecast; the other costs are actual expenditures.

16. In its resolution 69/274 A, the General Assembly requested the Secretary-General to submit to it future proposals for renovating the Library and South Annex Buildings as separate projects outside the scope of the capital master plan. However, no progress has been made to date. The Administration states that given the current security environment and the inability of either building to be retrofitted cost-effectively to meet higher bomb blast standards, comprehensive future proposals will be prepared only once the General Assembly makes a decision on the question of long-term accommodation in New York. However, the Administration has carried out some modifications to the buildings at a cost of $3.1 million, including the construction of a curtain wall, to allow limited occupancy of the buildings.

Change orders

17. As noted in previous reports, there have been a large number of change orders to contracts because the Administration began construction work using incomplete designs rather than awaiting complete detailed design documents (see **annex I**). The approach added some risk and uncertainty; **figure II** shows that there were some 4,700 change orders, with a total value of $497 million, as at March 2016. Some 400 change orders were approved between March 2015 and March 2016. The total excludes some 140 change orders that the Administration approved but that were not converted into a formal contract amendment because of a dispute between the main contractor and a subcontractor (see sect. C). The Administration was unable to provide the Board with the value of these change orders, but has since estimated that they would not exceed $3.7 million.

Figure II
Volume of change orders



Source: Board analysis of the Administration's data.

Savings from construction contracts

18. The Administration has "recycled" savings from construction contracts to meet costs in other areas of the project. In March 2013, the Board identified an estimated $20 million of expected savings under guaranteed maximum price contracts, with $10 million used to fund project costs elsewhere (see A/68/5 (Vol. V), para. 34 and A/69/5 (Vol. V), para. 19). In June 2015, the Administration estimated $39.5 million of cumulative savings from its obligations with the main contractor to the end of the project, which was revised upwards to $42.2 million in March 2016.

19. Recycling savings in this way has enabled the Administration to minimize the need for additional assessments of Member States, and has allowed for cost overruns in some areas of the project to be absorbed. The savings also funded some work not within the original design of the capital master plan project (for example, the construction of new cafeteria facilities). However, the redeployment of these savings has not been reported in a transparent manner to Member States, and the Administration has been free to apply them where it saw the greatest need. The Administration informed the Board that "once all works are completed and no changes are made, any remaining balances will be returned".

Claim against the main contractor

20. As noted in previous reports, contractual disputes and claims may crystallize towards the end of construction projects. In July 2015, the main contractor filed a notice of arbitration against the United Nations seeking indemnification in the event it is required to settle a substantial claim from one of its subcontractors. The subcontractor alleges that throughout the duration of its work on the capital master plan, the main contractor, the United Nations and its architects, engineers, programme managers and other consultants directed an extraordinary number of additions and changes to the scope, character, schedule and sequence of its work. The subcontractor alleges that as a direct result of these changes, it was compelled to perform its work out of sequence and in an accelerated and inefficient manner, incurring a significant amount of uncompensated costs.

21. The Administration has rejected the main contractor's request to indemnify it against the subcontractor's claim. However, the Office of Legal Affairs has retained outside legal counsel, funded from the project budget, to defend the interests of the United Nations in the arbitration process. In the event that the claim for indemnification succeeds, further funding would be necessary, depending on the amount awarded to the subcontractor. Subsequent to the audit, the Administration informed the Board that a second subcontractor was also in dispute with the main contractor.

Resourcing the project to completion

22. In its eleventh annual report on the project (A/69/5 (Vol. V), the Board recommended that the Secretariat "clarify to the General Assembly during the main part of its sixty-ninth session which elements of the scope of the project will not be delivered as part of the capital master plan and define plans for delivery and any budgetary implications". In response, in the twelfth annual progress report of the Secretary-General on the implementation of the capital master plan (A/69/360), it was stated that after June 2015, "responsibility for certain post-renovation construction activities that are within the original project scope, together with other

administrative tasks, will be transferred from the Office of the Capital Master Plan to the Office of Central Support Services".

23. Before its closure, the Office of the Capital Master Plan developed plans to transfer a core team of 8 staff, 3 contractors and 20 consultants from the programme management firm to the Office of Central Support Services to close all outstanding contracts and manage the remaining works. The core team was expected to cost an additional $2.8 million, funded from the project budget. The Office of Internal Oversight Services audited the closure of the Office of the Capital Master Plan and judged the transition plans to be "satisfactory". The transfer of specialist staff mitigated the risk that the Office of Central Support Services would have insufficient skilled staff resources to complete the project on time and within budget.

24. In practice, the revised plan of the Office of the Capital Master Plan to complete construction and close all guaranteed maximum price contracts proved over-optimistic. Completion will take at least a year longer than expected, and the scope and duration of responsibilities transferred to the Office of Central Support Services is greater than originally envisaged. As a result, the Office of Central Support Services has reassessed the resources required to manage the project to completion.

25. **Table 5** shows the additional cost of managing the project to completion: since the closure of the Office of the Capital Master Plan, it has increased from $2.8 million to $6.6 million, of which an estimated $4.2 million will occur in 2016. This reflects a significant increase in the projected use of programme management consultants. The increase is not yet fully reflected in the anticipated final cost reported in the thirteenth annual progress report of the Secretary-General on the implementation of the capital master plan (A/70/343).

Table 5
Revised estimates of the cost of completion (March 2016)

Component	*Period*	*Months*	*Cost (United States dollars)*
Administration's original plan (as at June 2015)			
Five United Nations staff to close out contracts of main contractor (2 P-5; 2 P-4; 1 General Service (Other level))	1 July-31 October 2015	4	312 600
Three external contractors to close out contracts of main contractor	1 July-31 October 2015	4	42 000
Three United Nations staff to project manage capital works (2 P-4; 1 General Service (Other level))	1 July 2015-31 December 2016	18	716 400
United Nations staff and contractor cost total			**1 071 000**
Programme management consultancy costs	1 July-31 December 2015	6	1 762 610
Total costs for closing out project			**2 833 610**

Component	*Period*	*Months*	*Cost (United States dollars)*
Board estimate[a] (as at March 2016)			
United Nations staff to close out contracts of main contractor (2: 1 P-5; 1 P-4) (3 vacancies: 1 P-5; 1 P-4; 1 General Service (Other level))	1 July 2015-31 December 2016	18	837 975
Three external contractors to close out contracts of main contractor	1 July 2015-30 September 2016	15	184 603
United Nations staff to project manage capital works (2: 1 P-4; 1 General Service (Other level)) (1 vacancy: 1 P-4)	1 July 2015-31 December 2016	18	488 200
United Nations staff and contractor cost total			**1 510 778**
Programme management consultancy costs	1 July 2015-31 December 2016	18	5 122 881
Total costs for closing out project			**6 633 659**

Note: Information presented to the Board indicates that the project budget will fund three contractors and two United Nations staff to perform the administrative close-out and that a third United Nations post will be met from another United Nations budget.

[a] The term of the three contractors was extended multiple times from the original plan to finish on 31 October 2015. As at March 2016, their contracts are due to end on 30 September 2016.

United Nations staff in the core team

26. Cost pressures led to reductions in the size of the capital master plan project team, the number of programme management consultants and the size of the main contractor's team (see A/69/5 (Vol. V), para. 47). A total of 28 personnel (8 from the Office of the Capital Master Plan and 20 consultants) were retained to manage the final phases of the project following the closure of the Office from July 2015. However, as at March 2016, four of the eight staff who had transferred from the Office of the Capital Master Plan to the Office of Central Support Services had left and none had been replaced, leaving the following four staff performing the following duties:

- A Chief of Administration responsible for financial oversight, financial close-out and reconciliation, and management of contracts for external support;
- A Project Manager responsible for managing the close-out of the project, demolition of the North Lawn Building and landscaping, and the works at 42nd and 48th Streets;
- A Public Information Officer responsible for media events, press releases, photographic documentation of the project and organizing tours of the site for stakeholders;
- An Administrative Assistant to support delivery of the remaining scope.

27. The Board questioned the need to retain a Public Information Officer at a cost of $195,600 per year at this late stage of the project when publicity around the project was waning; however, the Administration confirmed that it considered the post necessary until the end of the project, although it had originally planned to discontinue the post in October 2015. The Administration has since stated that the

Public Information Officer and the Administrative Assistant do not work on the capital master plan full-time and have other duties in the Department of Management. In addition, the functions of the Chief of Administration were assumed by the Chief of the Administrative, Finance and Personnel Section, the post of which is wholly funded by the Facilities Management Service of the Office of Central Support Services, and the capital master plan post of the Chief of Administration was therefore unencumbered, resulting in additional savings. The Board notes that the former Chief of Administration on the capital master plan and the Chief of the Administrative, Finance and Personnel Section are in fact the same individual.

Growing cost of consultancy support and breach of procurement rules

28. In 2004, the Secretariat signed a seven-year contract with a programme management consultancy to provide expertise in cost estimating, project management, cost management and document management. The consultants were located with the project team and the main contractor, forming an integrated team in line with good practice. Engaging specialist consultants is costly, and as at March 2016 the contract had been amended 36 times, extending the end date from December 2011 to December 2016 and increasing the total not-to-exceed value from $15.9 million to $59 million.

29. On 15 December 2015, approximately two weeks before the contract was due to expire and just before the beginning of a major holiday season, the Facilities Management Service requested the Procurement Division to action a thirty-fifth amendment that would extend the contract to 31 December 2016 at an increased cost of $3.4 million. The memo also contained a request that "in view of the Headquarters Committee on Contracts (HCC) threshold, the extension be prorated and split into two elements; (i) a 2 month extension from 1 January to 29 February 2016 (NTE $601,180), and (ii) a 10 month extension from 1 March to 31 December 2016 (NTE $2,759,091)".

30. The Board questioned the legitimacy of the amendment during its audit, noting that it did not comply with section 12.3 of the United Nations Procurement Manual, which requires approval by the Headquarters Committee on Contracts of any proposed amendment or modification of a contract previously reviewed by the Committee where the amendment, modification or renewal increases the previously approved not-to-exceed contract value by more than 20 per cent or $500,000, whichever amount is lower.

31. The Administration initially rejected the Board's concerns, stating that the thirty-fifth amendment had been reviewed by the Headquarters Committee on Contracts and recommended for approval. However, after further review, the Administration conceded that an "administrative error" had been made and that the Procurement Division had exceeded its delegated authority not only on the thirty-fifth amendment, but also on the thirty-fourth amendment. Both contract amendments were therefore withdrawn and resubmitted to the Committee, which recommended that the contract be extended to December 2016 at a not-to-exceed value of $59.02 million.

32. In the Board's view, the contract was poorly administered for the following reasons:

- The administrative errors only came to light following the Board's annual audit and had not been identified by Procurement Division officials or the Headquarters Committee on Contracts. It is a matter of concern that internal controls failed to prevent or detect the breach of procurement rules;
- It is unclear why the contract amendment request was submitted so close to the contract expiration date when the requirement to extend the contract for consultancy support into 2016 was known weeks earlier;
- The Headquarters Committee on Contracts had raised concerns on whether the Secretariat was getting good value for money, namely, that the firm was contracted for time and materials for "on-call" services on an hourly basis, but was in effect providing ongoing services to the project for several years. The Committee recommended that, on the basis of the significant cost increase over the life of the project, the Procurement Division approach the firm to seek volume discounts. The Administration responded that this was a lesson for future projects;
- The contract amendment was not based on fully accurate costings. As the actual rates for 2016 were not known, a maximum 3 per cent increase in the consultancy rates was assumed. In addition, when resubmitting the request under a thirty-sixth amendment, the Administration reduced the amount requested by $0.4 million owing to an unused not-to-exceed value from the previous amendment.

33. The Administration believes that programme management consultants will not be required beyond December 2016. However, programme management consultants are essential for the timely completion of the capital master plan project, and their services will be needed even after the completion of the construction works to ensure proper administrative close-out and final reconciliation of accounts. As this will probably continue into 2017, a further contract extension may be required, increasing costs further. In view of the cost increases to date, the Administration needs to manage the costs of consultancy services closely to ensure that they do not lead to further increases in the anticipated final cost of the project.

C. Project schedule and scope

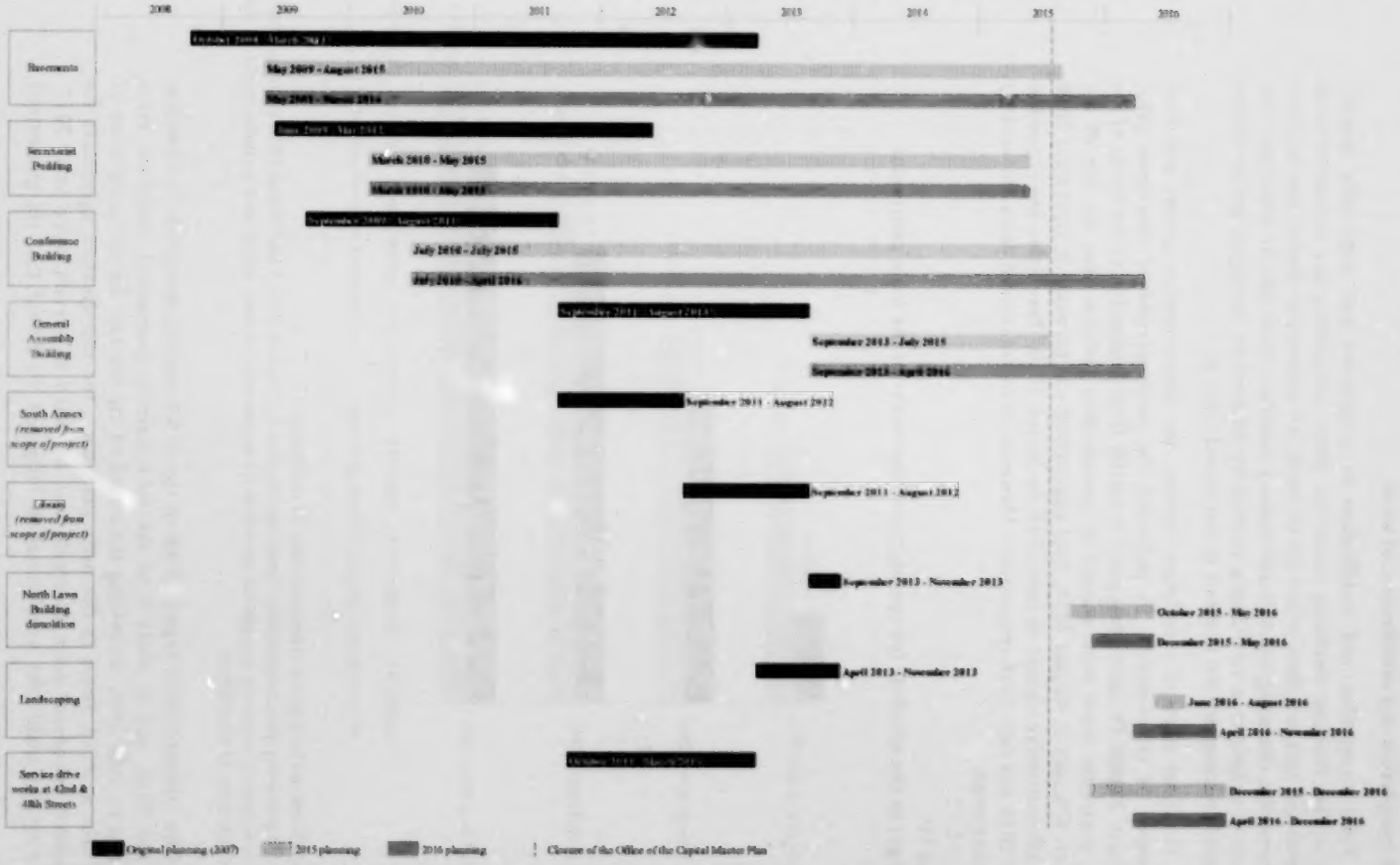
Overall progress against project schedule

34. Historically, the project has suffered a series of delays, but following the implementation of an accelerated implementation strategy, the main construction phase of the project was declared substantially complete in September 2014 upon handover of the General Assembly Building to the United Nations. The Administration is currently on schedule to finish all construction activity by the end of December 2016. **Figure III** shows how the forecast completion dates for the main elements of the capital master plan have changed.

35. Some of the delays depicted in **figure III** were due to unforeseen events, including the removal of large amounts of asbestos from the buildings, the need to meet more stringent security requirements and damage arising from Storm Sandy. In other cases, over-optimistic or incomplete planning assumptions resulted in the formulation of unrealistic target completion dates.

Figure III

Comparison of current schedule against previous year's planning and accelerated strategy IV (as at March 2016)



Source: Board analysis of the main contractor's master schedules and information supplied by the Administration.

Notes:

Dates reflect construction period up to final completion, excluding administrative close-out of projects. Timelines reflect Administration's plans as at March 2016.

In 2014, it was decided that the Office of Central Support Services would assume responsibility for residual capital works, namely, demolition of the North Lawn Building; landscaping; and service drive works at 42nd and 48th Streets (see A/69/360).

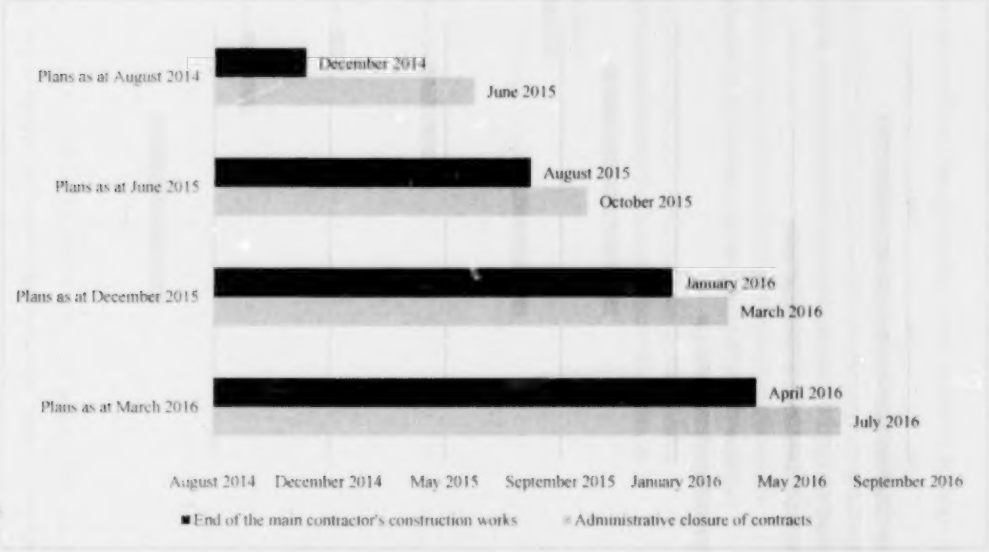
Service drive works at 42nd and 48th Streets were originally included as part of the overall basements contract.

Final completion and certification of work

36. Final completion and certification is a complex and potentially lengthy exercise that requires finalizing punch-list items, completing any corrective work required and agreeing final prices for all work. All contractual documentation, such as warranties, operating manuals and training materials, must also be submitted. The process is subject to a verification process by programme managers and architects of record to safeguard the interests of the United Nations.

37. The final stage of completion involves the administrative closure and final settlement of all contracts, in particular the main guaranteed maximum price contracts. **Figure IV** shows that plans to certify final completion of the works of the main contractor have been subject to considerable revision over the life of the project. Whereas in August 2014, final completion was expected in December 2014 with administrative closure in June 2015, by March 2016, these dates had slipped to April 2016 and July 2016 respectively. However, even the revised dates are unlikely to be achieved.

Figure IV
Changes in the schedule for completion of the works of the main contractor



Source: Board analysis of the Administration's information.

Note: All buildings were substantially completed in phases. December 2015 and March 2016 estimates for administrative close-out exclude the coordination agreement contract, which now includes works on the service drive at 42nd Street.

38. The Administration expected the works of the main contractor to be complete by April 2016, and to close 9 of the 10 remaining guaranteed maximum price contracts by July 2016. Following the award of the contract for the completion of the works at 42nd Street to the main contractor, the coordination agreement for guaranteed maximum price contracts was expected to remain open until 2017. Following the audit, the Administration informed the Board that six guaranteed

maximum price contracts, with a total value of almost $1,000 million, remained open, and that it now expects that the coordination agreement will be closed by December 2016.

39. It is clear, however, that the Administration has underestimated the effort and time required to close out the remaining 10 guaranteed maximum price contracts, and that a significant volume of work has not been finished. As at March 2016, there were still outstanding punch-list items across the works of the main contractor; 90 out of 510 subcontracts within the 10 open guaranteed maximum price contracts remained open; only 354 out of the 420 closed subcontracts had been paid in full; and $25.9 million of work had not been invoiced. The Administration informed the Board that since the audit, the total amount still to be invoiced had reduced to $14.4 million.

40. **Table 6** illustrates that in the past, there had been a long delay between substantial completion and final completion of works. On the basis of that experience, the Administration's assumption that it could achieve final completion of all guaranteed maximum price contracts by April 2016 was highly unrealistic.

Table 6
Expected completion dates of the main buildings (as at March 2016)

Building	*Substantial completion date*	*Final completion date*	*Period between completion dates*
Secretariat	September 2012	May 2015	32 months
Conference	February 2013	Yet to occur	Not complete after 37 months
General Assembly	September 2014	Yet to occur	Not complete after 18 months
Basements	March 2015	Yet to occur	Not complete after 12 months

Source: Board analysis of the Administration's information.

41. In February 2016, the main contractor also informed the Administration that none of the contracts could be closed until the claim raised by the subcontractor against the main contractor was resolved. In practice, there is little the Administration can do to close the contracts without the full cooperation and agreement of the main contractor. As at March 2016, the level of withheld funds ($6.6 million is currently retained) does not provide a major incentive to encourage the contractor to close the contracts ahead of agreeing a final settlement of the outstanding claim, and the Administration has limited contractual sanctions available to enforce closure or to penalize the contractor for further delays. As the timescale for settling the disputed claim is unclear, the timetable for final administrative closure of the contracts is uncertain and could lead to increased costs, since the Administration may need to employ cost consultants and legal advisers for an extended period.

42. The Administration informed the Board that as of June 2016, the level of funds retained had reduced to $4.1 million, and that the contracts that cover the disputed works could be closed unilaterally by the Administration.

Residual capital works

43. In its previous report, the Board stressed the need to closely manage the remaining project activities to ensure their completion on time and within budget. Following closure of the Office of the Capital Master Plan in July 2015, the Office of Central Support Services assumed responsibility for executing the works and, despite some initial slippage in the original timetable, remains confident of achieving the December 2016 completion date.

Demolition of North Lawn Building and landscaping works

44. In its resolution 70/239, the General Assembly noted with concern the continued delays in the demolition of the temporary North Lawn Building, and requested the Secretary-General to ensure that the demolition of the building was completed without further delay. The procurement exercise was completed in October 2015, and demolition work was proceeding smoothly at the time of audit. However, the expected completion date has slipped once again, and now the work is not expected to be complete before November 2016.

45. **Table 7** shows that the contract contains a modified timetable compared with the schedule suggested in the Administration's request for proposals prepared by the Office of the Capital Master Plan. There is one month longer for demolition, and the period between substantial and final completion of landscaping has increased from 3 weeks to 11 weeks. Those changes should make the timetable more achievable.

Table 7
Comparison of forecast and actual key contract milestones

Activity	*Request for proposal (July 2015)*	*Signed contract (October 2015)*
Construction starts	6 November 2015	18 December 2015
Demolition of floors 1-3 complete	1 February 2016	12 April 2016
Substantial completion of demolition	8 March 2016	12 May 2016
Landscaping starts	15 April 2016	15 April 2016
Substantial completion of landscaping	15 August 2016	1 September 2016
Final completion	1 September 2016	18 November 2016

Source: Board analysis of the Administration's information.

Works on the 42nd and 48th Street drives

46. In resolution 70/239, the General Assembly requested the Secretary-General to ensure the timely conclusion of the procurement process and the completion of the security-related work at 42nd and 48th Streets before the end of 2016. **Table 8** shows that since the Board's previous report, there was a further three month delay in initiating the procurement process, and work commenced two months later than planned. Although the expectation was that the work would take 12 months to complete when the Board last reported, it is now scheduled to take only 8-9 months.

Table 8
Comparison of forecast and actual key procurement milestones for works at 42nd and 48th Streets

	Expectation as at June 2015	*Status as at March 2016*
Request for proposal issued	August 2015	November 2015
Contract awarded	November 2015	42nd Street: awarded to the main contractor
		48th Street: March 2016
Forecast construction period	December 2015 to December 2016	42nd Street: February to September 2016
		48th Street: April to December 2016

Source: Board analysis of the Administration's information.
Notes:
Expectation as at June 2015 reflects the Administration's schedule as reflected in the Board's previous report. In March 2016, the Administration signed a contract to perform the works at 48th Street with the same lead subcontractor as for the works at 42nd Street.

Procurement of service drive works

47. The original intention was for the United Nations to award one contract for the service drive works through open competition. However, to achieve completion of the work by December 2016, the Administration decided to request the main contractor to deliver the 42nd Street drive works and to open only the 48th Street works to competitive bidding. The Assistant Secretary-General for Central Support Services estimated that the management overhead charged by the main contractor would incur an additional cost premium of $1.5 million on top of the $5 million cost of the works, which were to be performed under the "coordination agreement" contract.[1]

48. The $10 million contract for the 48th Street works was let competitively and subsequently awarded to the same contractor who had been selected by the main contractor to carry out the 42nd Street works. In March 2016, the Administration informed the Board that it was negotiating with the main contractor to transfer the 42nd Street works to the winning vendor of the 48th Street works to reduce the $1.5 million management costs due to the main contractor.

49. While the Administration is attempting to reduce the overall cost of the two contracts by reducing the role of the main contractor, the principle of open competition was effectively applied to the 48th Street works only. The Board was also concerned that the winning vendor may have secured an advantage by being awarded the 42nd Street works ahead of bidding for the 48th Street works. The Administration is satisfied, however, that the process it followed was in full compliance with the procurement rules and regulations applying to the capital master plan.

[1] The "coordination agreement" contract covers a range of "basic services" to generally coordinate the execution of the subprojects so that the capital master plan project functions as a whole. Historically, the Office of the Capital Master Plan used the contract to authorize its main contractor to purchase items with a long procurement lead time while finalizing the relevant guaranteed maximum price contract.

50. The revised delivery strategy was still being finalized at the time of audit, but on the basis of the information available, substantial completion of the works should be achievable by December 2016. Final completion and closure of contracts is likely to extend into 2017, on the basis of past experience.

Interim solutions for Library and South Annex Buildings

51. The interim solutions necessary for the Library and South Annex Buildings to comply with more stringent security standards have been completed, and the $12.5 million cost was met from existing funds. The interim solutions included:

- The Library Building was reconfigured to limit staff presence to the north side of the building, with the south side reserved for storage;
- The cafeteria in the South Annex Building was closed, with alternative food services established in the Secretariat and Conference Buildings;
- Classrooms and offices in the South Annex Building were relocated to the third basement of the North Lawn Extension Building.

52. As shown in **table 9**, as at March 2016, there were significant delays in completing the interim solutions compared with the original plan developed by the Office of the Capital Master Plan before it closed in July 2015.

Table 9
Comparison of schedule of works for interim solutions

	Office of the Capital Master Plan expectation as at June 2015	*Status as at March 2016*
Library Building	Completed by August 2015	Substantial completion: unknown Final completion: March 2016
Alternative food services in Secretariat and Conference Buildings	All three locations completed by July 2015	Substantial completion: September 2015 Final completion: January 2016
Classrooms and offices in North Lawn third basement	Construction to start in September 2015 and finish in January 2016	Works commenced in November 2015, with substantial completion expected in April 2016

Source: Board analysis of the Administration's data.

Project management disciplines

53. Although only an estimated $55.4 million of work was due to be completed when the Office of the Capital Master Plan closed (see A/70/343, para. 79), this is still a significant investment and comparable to the total cost of other construction projects, such as the $56.9 million estimated cost of the Africa Hall renovation project at the Economic Commission for Africa (see A/70/363, para. 31). Strong project management disciplines are therefore still required to ensure the project remains on time and within budget.

54. The project management approach appears to have been relaxed, however, as the project approaches completion. In particular:

- The anticipated final cost of each subproject is no longer updated to the end of the project;
- The Administration has not developed an updated consolidated project plan that details all key milestones and project activities;
- The costed risk register has not been updated since March 2015 to reflect risks currently facing the project.

55. The Administration informed the Board that it continues to exercise strong project management disciplines and that it has put in place adequate resources, ensuring that the management and scrutiny of all of the remaining activities is maintained. However, the absence of strong project management discipline in the final phase of the project risks incurring further delays and increased costs in the final phase of the project. Although major shocks are unlikely at this stage of the project, it would be unwise to assume that they cannot occur.

D. Managing the campus

56. The campus works were all substantially completed and handed over to the United Nations by September 2014. Section D provides an update on the Administration's approach to managing and maintaining the renovated campus. While the transition has gone well to date, an agreed long-term maintenance plan is not yet in place to preserve the value of investment by Member States in the capital master plan.

Managing everyday operations

57. The Board employed a consultant to perform a non-intrusive visual inspection of the campus, which revealed no significant issues. The transition from managing the construction phase of the project to running the day-to-day operations has also been successful. Although there are close to 20,000 service requests made to the Facilities Management Service help desk each year, there have been no major complaints, critical incidents or major disruptions to operations logged by the help desk since handover of the refurbished accommodation. The Facilities Management Service has put in place a number of systems maintenance contracts to ensure that the newly installed systems are appropriately maintained; this investment should help to prolong serviceability and avoid disruptions.

58. On average, fewer than 600 requests per month are made regarding core services, such as heating, ventilation and air conditioning, electrical and plumbing systems, which is considered comparable to the experience with similar-sized campuses. The information captured by the help desk is comprehensive, but the Facilities Management Service could go further and develop a simple management dashboard to report performance against key indicators, such as user satisfaction, and set standards regarding the expected volume and type of calls to the help desk, which could be used to monitor performance.

Maintenance arrangements

59. The Board has previously cautioned against an expectation that the Office of Central Support Services will be able to reduce the level of the budget for the refurbished campus. While the assumption may be that newly renovated buildings should require less maintenance effort, the more sophisticated plant and equipment may need more constant and expensive care (see A/69/5 (Vol. V). The systems installed as part of the renovation are critical to the effective operation of the campus. Effective maintenance will help to avoid unplanned loss of services, which could disrupt staff and representatives of Member States working on campus, and also prolong their useful operating life.

60. The Administration has entered into 34 maintenance service contracts[2] for Headquarters at an estimated yearly cost of almost $18 million, of which over $11 million is for cleaning services and the balance for servicing the newly installed systems. Some of the maintenance contracts are with an outside specialist, which is appropriate in the short term. In the longer term, the Administration could consider further reducing reliance on outside support by investing in training its own staff to perform functions currently performed by outside suppliers and through selective recruitment of specialist staff. For example, in 2015, the Administration spent over $35,000 on external training to improve staff skills and knowledge of the new systems.

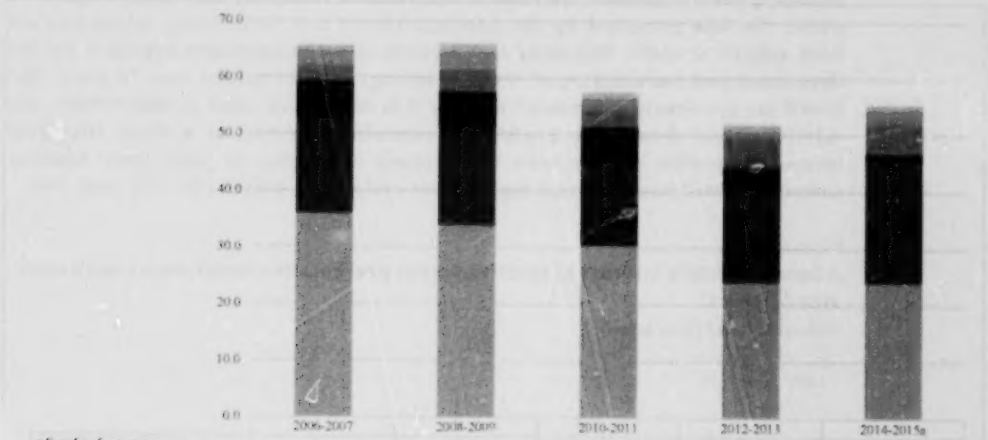
61. Managing the renovated building and systems has required four additional staff in the Plant Engineering Section,[3] increasing the complement to 83 staff. Coupled with the reallocation of posts from custodial and alteration teams, the Administration has now increased its capacity to perform electrical repairs. **Figure V** shows that the total cost of maintenance (non-utilities) is broadly the same as before the capital master plan, and that the renovated buildings have initially incurred lower expenditure on utilities owing primarily to a substantial reduction in the use of steam.

62. The Board stated previously that had the Administration contracted for both installation and a period of maintenance of equipment and systems, it could have avoided the risk of having a period of time without key maintenance contracts in place (see A/70/5 (Vol. V)). Additionally, it would have ensured stability of systems and provided sufficient time for staff to gain training and expertise or alternatively gather more informed operating data to obtain value for money from outsourcing. The Administration intends to commission a specialist firm late in 2017 to review its maintenance approach. This also provides an opportunity to assess the balance between outsourcing and in-house provision to ensure the cost-effective use of available resources.

[2] Excludes contracts for supply of materials and parts, of which there are 24, with a cumulative value of $0.8 million.

[3] The section within the Facilities Management Service responsible for planning and organizing operational maintenance of buildings, including the running of mechanical, electrical and plumbing systems.

Figure V
Maintenance and utilities expenditure on Headquarters (2006-2007 to 2014-2015)
(Millions of United States dollars)



	2006-2007	2008-2009	2010-2011	2012-2013	2014-2015[a]
Supplies for maintenance	1.0	1.4	1.1	1.2	0.9
Elevator operations	2.5	3.1	2.0	1.3	2.3
Miscellaneous maintenance services	2.8	4.0	3.1	4.9	5.4
Electrical maintenance	6.8	6.5	6.5	4.1	1.3
Cleaning services	16.7	17.2	14.6	16.3	21.6
Utilities	35.9	34.0	30.4	24.0	24.0

Source: Board analysis of the Administration's data.
[a] 2014-2015 costs are pro rata estimates on the basis of 22 months of expenditure data.

Long-term asset management

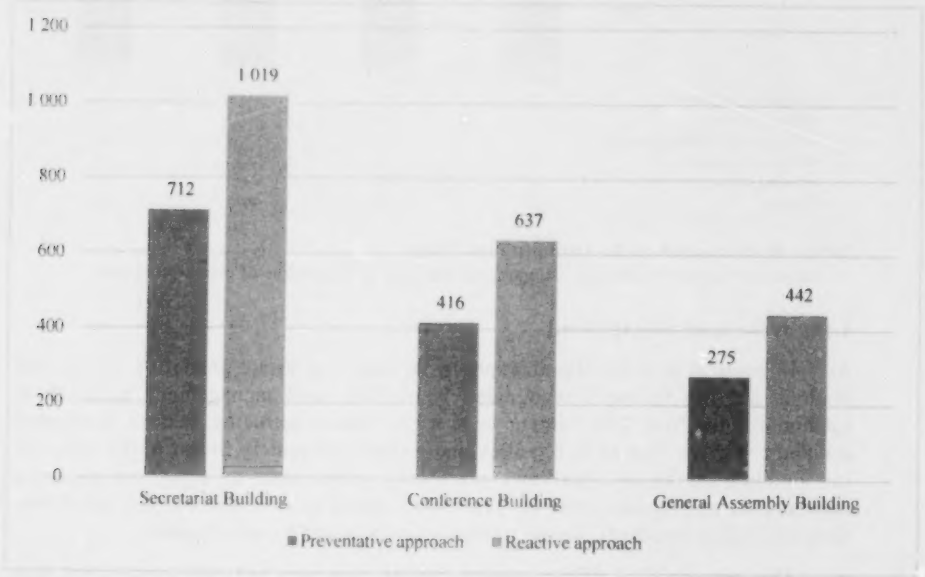
63. In contrast to most organizations with large real estate portfolios, the United Nations did not follow a recognized whole-life asset management approach to maintaining the New York campus once it had been constructed. Instead, it adopted a mainly reactive "run to fail" policy and did not adequately invest in the fabric of the building or in its plant and machinery, other than to carry out essential maintenance and repairs. Over the years, the campus deteriorated and fell out of line with legislative standards, normal industry practice and its users' needs.

64. The ensuing $2.3 billion capital master plan was not only costly, but also highly disruptive. **Annex I** contains the Board's paper on lessons from the capital master plan, which outlines four broad approaches to maintaining assets. By undertaking capital improvements, the United Nations could better protect the $2.3 billion investment, reduce overall capital costs and minimize the need for large-scale and high-risk projects in future.

65. Of key importance to any asset management plan is having comprehensive data. The strategic capital review assessed the condition of the global estate for the first time, and by performing a life cycle replacement analysis the Administration proposed its first 20-year rolling capital programme. The long-term capital requirements for the global estate equate to an average cost of $130 million per biennium, which is higher than historic average biennium expenditure on capital maintenance.

66. The Administration commissioned consultants to perform a comparative cost-benefit analysis of adopting a reactive, compared with a proactive, maintenance approach. The assessment was built on a detailed assessment of five buildings, including the Conference, Secretariat and General Assembly Buildings. **Figure VI** shows the data presented by the Administration's cost consultants, which has not been subject to audit, indicating that a preventative maintenance approach for the three renovated buildings could result in savings of $694 million over 50 years. The Board has previously commented that, for it to be of more value to stakeholders, the Administration should also explain the expenditure profile, as a whole life cycle investment profile can fluctuate significantly from year to year, since building components will have different replacement cycles (see A/68/5 (Vol. V), para. 74).

Figure VI
Administration's forecast of reactive versus preventative maintenance approach over 50 years
(Millions of United States dollars)



Source: Advisory Committee on Administrative and Budgetary Questions.

Maintenance of the East River fence

67. In response to an enquiry from the Advisory Committee on Administrative and Budgetary Questions, the Board enquired whether renovation of the East River fence was in the scope of the capital master plan and whether there were any future plans to paint it. The Administration confirmed that painting the fence was not part of the scope of the capital master plan, and that it did not have firm plans in place to renovate the fence. However, the Administration confirmed that there is a requirement to maintain the structure overhanging FDR Drive, which is currently under discussion. No information on the potential costs of that work was provided for audit.

E. Maximizing the benefits of the renovated campus

68. Good practice upon the conclusion of a major project is to conduct a thorough review of the benefits realized. As the capital master plan is in the final stages of the project life cycle, it is important that the Administration clearly demonstrates the benefits accrued from the $2.3 billion investment made by Member States.

69. The Board's previous report recommended that the Administration report whether the expected outcomes from the capital master plan have been delivered, including financial and non-financial benefits (see A/70/5 (Vol. V), para. 17(b) of the summary). In response, the thirteenth annual progress report of the Secretary-General on the implementation of the capital master plan (A/70/343) contained the most comprehensive benefits statement to date, including a range of qualitative statements that demonstrate how the capital master plan had achieved the original outcomes expected (see A/55/117), namely, a headquarters campus that:

- Is energy-efficient, free of hazardous materials and compliant with the building, fire and safety codes of the host city;
- Provides full accessibility to all persons;
- Meets all reasonable, modern-day security requirements;
- Preserves the original architecture to the greatest extent possible.

70. As noted in section D, the renovated buildings and basements are operating well. They provide a more modernized working environment operated by more sophisticated systems and equipment, with improved security for much of the campus and a significant amount of asbestos abatement. Those improvements were delivered while retaining the important architectural and aesthetic heritage and maintaining business-as-usual operations.

Energy efficiency

71. The thirteenth annual progress report of the Secretary-General states that the Headquarters complex in its entirety was evaluated as equivalent to "Gold" certification under the Leadership in Energy and Environmental Design methodology,[4] with the Secretariat Building rated at the "Platinum" level. The Administration provided a report commissioned from its environmental consultants on 15 April 2016 that confirms these ratings and that they were extrapolated across the other assessment methodologies listed. The thirteenth annual progress report of the Secretary-General also states that quantifiable benefits have been achieved through improved environmental performance, including:

- a 50 per cent reduction in energy consumption;
- a 40 per cent reduction in fresh water consumption;
- a 45 per cent reduction in greenhouse gas emissions.

[4] The system used in the United States of America is known as Leadership in Energy and Environmental Design. In the United Kingdom of Great Britain and Northern Ireland, the evaluation system is known as the Building Research Establishment Environmental Assessment Method. The system used in Japan is known as the Comprehensive Assessment System for Building Environmental Efficiency and that of Australia is known as Green Star.

72. As noted by the Advisory Committee on Administrative and Budgetary Questions, the efficiencies were calculated using engineering models rather than actual performance. The Advisory Committee recommended that actual data be presented for audit to substantiate the improved environmental performance. The Administration maintains that it cannot yet assess whether the renovated campus has achieved these energy efficiency targets. It is installing meters in each building that connect to the building management system to collect data on energy efficiency. However, there is no baseline for energy performance of individual buildings to prove efficiency gains because, unlike the strategic heritage plan, meters were not installed prior to renovation. The Administration expects the new environmental reporting system to produce reliable data from April 2016.

73. At present, the only data available to measure energy efficiency are utility bills. The Administration informed the Advisory Committee that meaningful comparison of consumption before and after the capital master plan would only be possible after the removal of the North Lawn Building, because its use of energy and water was not separable from that of the other buildings on campus. The Advisory Committee stated that quantifiable benefits should be substantiated, and requested the Administration to present such information to the Board for audit (see A/70/441). However, the Administration did not provide a baseline model of energy consumption or the consumption data required to enable the Board to assess progress made against the energy targets.

74. However, the Administration was able to provide some information that showed expenditure on utilities had fallen significantly over the past decade, from $34.9 million (2006-2007) to $24 million (2014-2015), notwithstanding a significant increase in gas consumption. In the absence of actual consumption data, the Board developed a baseline model using the expenditure data and drew on publicly available historical average utility rates for commercial premises in New York.[5] This analysis, while only an indicative estimate, suggests that overall it is likely that the renovated campus delivered significant improvements in energy and water efficiency between 2006 and 2015. Only when data on actual energy consumption is available will it be possible to confirm whether the renovated buildings meet the energy efficiency goals stated above.

75. In its resolution 70/239, the General Assembly requested the Secretary-General to provide in his fourteenth annual progress report data on current utility consumption, including consumption patterns prior to the capital master plan. Energy and water supplies to the North Lawn Building ceased in January 2016. On that basis, the Administration will be able to report on 12 months of data on utility consumption in January 2017 using utility bills, and in April 2017 there will be 12 months of data from the environmental reporting system. That information will enable the Administration to demonstrate the full range of energy efficiencies obtained.

Accessibility

76. The Administration reports that the capital master plan also improved physical accessibility to and within the Headquarters compound, and that it is now fully

[5] The Board used the New York State Energy Research and Development Authority historical price index for electricity and gas, Consolidated Edison, Inc. historical tariffs for steam and New York City Water Board historical rates for water and sewage.

accessible to, and usable by, individuals with disabilities. The improvements noted include power-assisted doors at all major entrances; disabled toilets; life safety systems, including speakers/strobes; enhanced support for assisted-listening devices; and podiums in all conference rooms that have been lowered enough to allow ramp access.

77. A non-intrusive review of the campus confirmed that the project appears to have adapted the 1950s campus, where practical, to improve accessibility and bring it into line with minimum recognized standards. The requirement to preserve the original architecture to the greatest extent possible has resulted in some areas where accessibility standards could be improved. For example, while there are disability lifts to move between the different tiers within some conference rooms, a person with disabilities could find it difficult to access some rooms unassisted because of the heavy doors in place. In addition, retaining the original design of the conference rooms means that it may be difficult for persons with disabilities (such as wheelchair users) to make full use of the facilities owing to the restricted space on podiums, for example.

Flexible workplace

78. Introducing flexible workplace can increase flexibility, provide a better working environment for staff that is more suited to their day-to-day working practices and significantly reduce annual real estate costs. In 2015, the Advisory Committee on Administrative and Budgetary Questions concluded that the business case to implement flexible workplace at Headquarters was sound as its implementation would see annual commercial rentals in New York fall from $57 million to less than $47 million (see A/69/810). In resolution 69/274 A, the General Assembly approved the implementation of the Secretary-General's proposal.

79. In 2016, the Administration opted to introduce a greater degree of customization, which is in reaction to feedback from staff and should better meet user requirements and working styles, with departments able to choose from different layouts depending on the type of work they perform (see A/70/708). The aim is to create an office space that makes it easier for staff to perform their duties.

80. As the Board has stated previously, the ideal opportunity to consider changing the use of workspace is during a newbuild or refurbishment project (see A/68/5 (Vol. V), para. 61). However, there is still a clear rationale for adapting the modernized floorplate following the renovation, including that:

- Structural improvements to the buildings make any reconfiguring of workspace for flexible working relatively simple;
- The Administration estimates that the cost of implementing comparable flexible workspace in the renovated Secretariat Building is $121 per square foot, in comparison to $224 per square foot in non-renovated buildings;
- The number of workspaces available for staff in the renovated buildings is 370 fewer than before the project,[6] creating the case for increasing the number of spaces in usable areas wherever possible;

[6] The Administration's data indicate that the total number of staff seats in the renovated buildings (Secretariat Building, basements, Conference Building and General Assembly Building) is 3,262, compared with 3,630 before the capital master plan.

- The workspace utilization study established that the renovated campus is not being fully utilized, and that on average between 38 and 48 per cent of desk spaces were in use at any one time during the day.

81. The Board has stated previously that flexible working will require clear and visible senior management sponsorship and leadership to facilitate cultural change, and that it remains important that senior management, including members of the Management Committee, lead by example and adopt new ways of working. The Under-Secretary-General for Management and the Assistant Secretary-General for Central Support Services have been visible and active champions of flexible workplace pursuant to the relevant General Assembly resolutions on the matter. The Department of Management has also engaged in an active communications campaign to explain the changes involved to senior managers, and also to staff in the face of resistance from the Staff Union, notwithstanding some positive feedback from staff working in the pilot areas.

82. However, some senior managers in the Secretariat have resisted implementing flexible workplace on the floors of the Secretariat Building where their departments are currently located, and others have resisted moving out of expensive leased accommodation in Manhattan despite a strong business case to do so. For example, the Department for General Assembly and Conference Management declined to vacate the Albano Building, citing two main operational reasons: (a) document processing services may be interrupted, affecting support to governing bodies; and (b) a 2009 move to the Albano Building gave rise to much stress and uncertainty and took a heavy toll on staff morale. Vacating the Albano Building would have enabled the Administration to reduce leasing costs by $12 million each year ($10 million in leasing costs and $2 million in operational costs).

83. The Administration accepts that space could be used more efficiently across Headquarters, and has proposed to accommodate 800 extra staff in the Secretariat Building and 150 further staff in eight floors of leased buildings by applying a seat-to-person ratio of 81 work seats to 100 staff. However, the resistance described above has led to a change in approach that has altered the business case. The estimated cost has increased from $49.6 million to $65.7 million because of increased customization, and the recurrent annual benefits have decreased from $19.8 million to $12.6 million, representing a return on investment in just over five years.

84. The Board remains of the view that making the best use of the space available in the renovated campus is essential to maximizing the return on the $2.3 billion investment by Member States. As with all transformation initiatives, some resistance to change is inevitable, and while all points of view should be considered, they must also be weighed against the potential efficiencies to be gained and the wider interests of the Organization.

85. Notwithstanding the change in approach, there remains a compelling business case for implementing flexible workplace strategies to optimize the use of space in the newly renovated campus. This argument has been accepted by the General Assembly in its resolutions, by the Advisory Committee in its reports, and by the Secretary-General. The lack of support from some senior managers is therefore a cause for concern and warrants further consideration by the Management Committee.

F. Acknowledgement

86. The Board wishes to express its appreciation for the cooperation and assistance extended to its staff by the Under-Secretary-General for Management and members of his staff.

(*Signed*) Mussa Juma **Assad**
Controller and Auditor General of the United Republic of Tanzania
Chair of the Board of Auditors

(*Signed*) Sir Amyas C. E. **Morse**
Comptroller and Auditor General of the United Kingdom
of Great Britain and Northern Ireland
(Lead Auditor)

(*Signed*) Shashi Kant **Sharma**
Comptroller and Auditor General of India

30 June 2016

Annex I

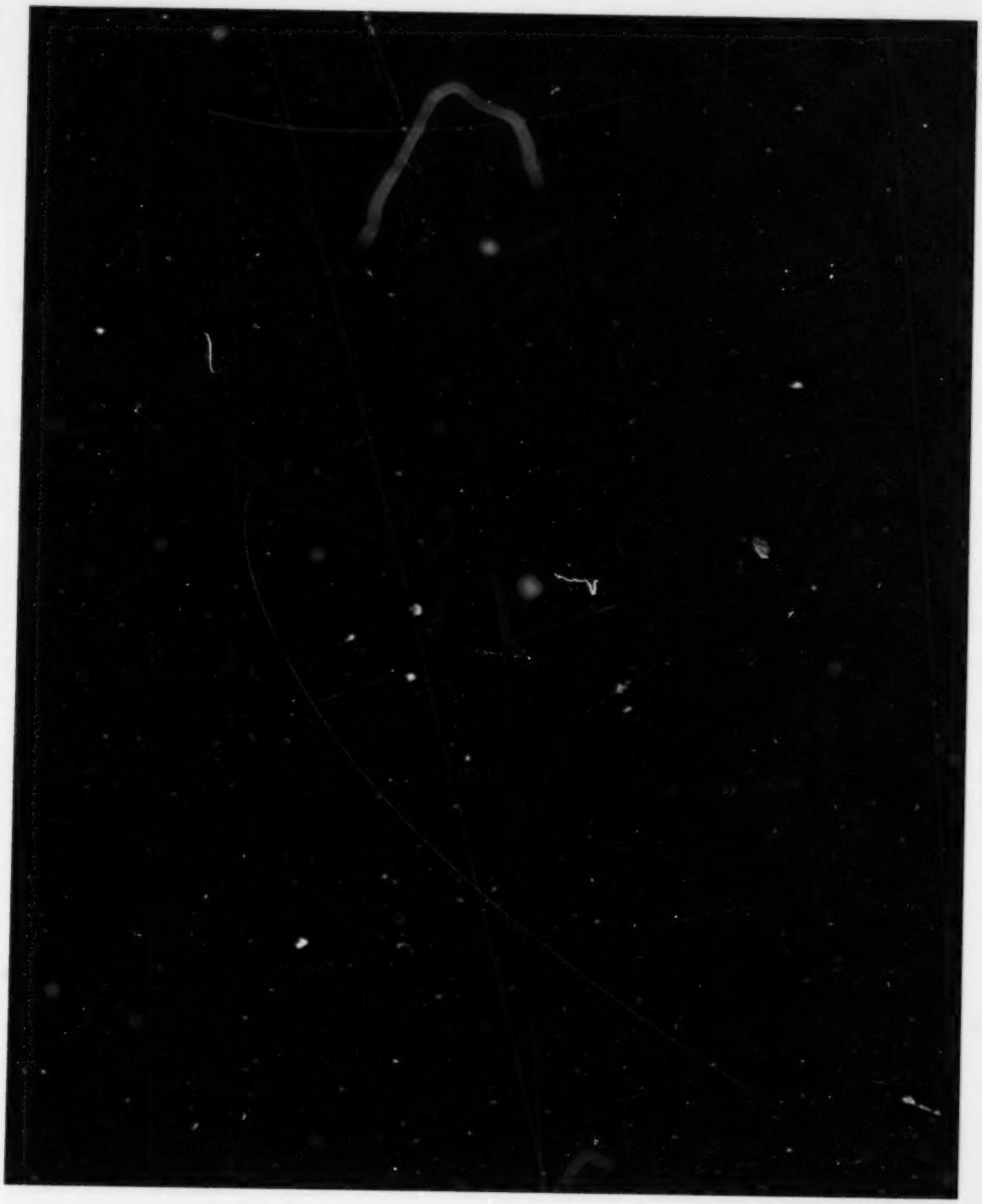
Lessons from the capital master plan*

* The present annex is reproduced without formal editing.

Lessons from the United Nations Capital Master Plan

A paper by the United Nations Board of Auditors

December 2014



Contents

Introduction 6

Theme 1: Whole lifecycle asset management 8

Theme 2: Getting the best possible start 11

Theme 3: Governance, controls and assurance 13

Theme 4: Roles within a programme lifecycle 18

Theme 5: Commercial and procurement strategies 21

Theme 6: Risk and contingency management 26

Theme 7: Cost, time and outcome forecasting 29

Theme 8: Portfolio management and organisational capability 32

Foreword

The Board has been reporting on the United Nations' refurbishment of its New York headquarters campus (the Capital Master Plan or CMP) for the last eleven years. We have seen at first hand good practices and the tactical decisions made as issues were tackled, but also avoidable problems. This paper looks at how the United Nations coped with some of the varied challenges and provides practical insights and, with the benefit of hindsight, draws out some learning themes that should have relevance to future capital programmes.

Identifying and acting on the lessons from the once-in-a-generation CMP project, indeed from any major project, is important in itself. But it is particularly important in a context where future projects are likely and the United Nations must respond to increasing challenges around the world at a time of fiscal constraints. Delivering more with the same resource is a capability that the United Nations will need to develop going forward, with cost over-runs on major projects becoming less acceptable, and the waste of scarce costly resources even less so.

This paper, drawing on the Board's work on the CMP and wider knowledge of best practice, is offered by the Board as a contribution to the learning process. It does not cover every lesson that might be learnt. But it does highlight, in our view, some of the more important and systemic lessons that apply both at a project-specific level and at the corporate level, where it is important to have effective and well-established, organisation-wide processes, standards and capabilities for project delivery. Many of the lessons are of direct relevance to future capital projects, in particular the Strategic Heritage Plan, which is now mobilising in Geneva. Several of the lessons about corporate capability would also apply to any corporate change programme whether asset-related or not.

Based on the insights gained from our regular reviews of the project since its inception we can say with confidence that the United Nations would benefit strongly by learning the lessons in a few key areas. For example, it is vital that major projects make a successful start as experience shows it is difficult and costly to recover. The effort to get projects right at the outset is rarely wasted. Best practice is to hold any major project to a very high level of scrutiny and independent expert assurance before any decision is taken to start or to initiate each major phase during the project lifecycle. This requires from the outset effective governance and decision-making, with accountabilities and authority aligned and clearly assigned, risk and contingency transparently and explicitly at the heart of the delivery strategy, and a collaborative and integrated project team and supply chain. These are central themes in this paper.

The lessons highlighted would, if taken on board, improve the chances of success on future projects by shrinking risk and promoting learning and standard-setting, and would enable the United Nations to move towards being an organisation with a modern asset management approach and project delivery capability.

We hope that this paper is of value to management, to those charged with governance, and to the representatives of member states with responsibility for oversight of the funding provided to such projects.

Amyas Morse

Comptroller and Auditor General of the
United Kingdom Of Great Britain and Northern Ireland
Chairman, United Nations Board of Auditors

Introduction

The renovation of the United Nations campus in New York (the Capital Master Plan or CMP) is a large and complex building refurbishment programme. The number of stakeholders, the organisation's decision processes, the iconic architecture that needed preserving, the security requirements, the need to keep the organisation running during the refurbishment and work around live operations, and the scale of the assets were all factors that influenced the way the CMP was managed.

The campus itself comprises five main buildings. Three of the buildings are operationally and physically interdependent: a three-level basement physically connecting the General Assembly, Conference Centre and Secretariat buildings, providing common utilities as well as an integrated campus-wide approach to security, cooling, heating and ventilation. The fourth and fifth buildings, the Library and Southern Annex, are more self-contained, although abutting the Secretariat building. Over time the condition of the estate had deteriorated beyond the point of reasonable repair, requiring a total overhaul rather than floor-by-floor refits. The General Assembly knew in 2000 that a complete refurbishment was needed and, after some significant false starts, approved the CMP project in its current form in 2007. The Secretary General broke the ground in 2008.

The Board, at the request of the General Assembly, provided annual reports on the CMP from 2002, reporting on differing aspects of the project during its lifecycle.[1] From 2008 onwards the reports focused predominately on the lead up to, and the delivery of, the construction phase, where the majority of the effort and expenditures occurred. This is the phase from which the majority of the lessons highlighted in this paper are drawn. The Board also increasingly commented on the weaknesses in benefits definition and realisation, including its potential as a transformative project, as well as the implications of the project for the management of United Nations' assets more widely.

[1] The reports can be found on the Board's website, available at www.un.org/en/auditors/board/reports.shtml.

This paper considers the way the United Nations has delivered the CMP and highlights lessons for consideration in planning future major programmes. It is not intended that this paper should provide a judgement on whether the CMP is a success or a failure. Nor is it intended as a toolkit of how to manage capital projects. Rather, it describes what happened during the CMP, and how the United Nations coped with those issues, and it highlights potential learning opportunities, setting this out across eight themes:

- **Theme 1** – Whole lifecycle asset management
- **Theme 2** – Getting the best possible start
- **Theme 3** – Governance, controls and assurance
- **Theme 4** – Roles within a programme lifecycle
- **Theme 5** – Commercial and procurement strategies
- **Theme 6** – Risk and contingency management
- **Theme 7** – Cost, time and outcome forecasting
- **Theme 8** – Portfolio management and organisational capability

Theme 1: Whole lifecycle asset management

In contrast to most organisations that own large real estate portfolios, the UN did not follow a recognised whole-life asset management approach to maintaining the New York campus once it had been constructed.

Instead, it adopted a mainly reactive (run until failure) policy from the 1960s, when the campus first became operational. The UN rarely adequately invested in the fabric of the building, or in its plant and machinery other than to carry out essential maintenance and repairs. The UN did not, and still has not established, an asset management strategy for the campus incorporating a planned ongoing maintenance regime. Arguably, the need for the UN having to run such a disruptive, intense capital refurbishment plan stems from not having a well-thought-through approach to asset management. The "patch and mend" reactive maintenance policy was not sufficient to keep pace with the adverse effects of the weather, and with the wear and tear caused by occupiers. There is also a limit on the number of times plant and machinery can be repaired before it wears out and before old practices become superseded (for example, safety standards).

Over the years the fabric of the campus deteriorated and fell out of line with legislative standards, normal industry practice and its users' needs. The ensuing $2.4 billion refurbishment programme was not only very costly but significantly disruptive for staff required to work in temporary rented accommodation for several years in buildings dispersed around New York.

The UN did not set aside a sinking fund to cover the costs of maintenance and upgrades. The budget for facilities management activities was one element among many in the Department of Management's budget. As such, it was inevitably at risk over the lifetime of the building from the effects of cost reduction exercises; these were mostly carried out on a 'top down' basis and the budgets were rarely enough to prevent a net degradation in the building from year to year.

Learning opportunities

The main corporate learning opportunities are:

- to have a physical asset management strategy that preserves the condition of the asset at a level that keeps it in a fit-for-purpose condition;
- to record comprehensively all drawings, operational manuals and maintenance and repairs records, thus providing certainty of the asset condition for future maintenance or refurbishment projects;
- to understand the relative importance of usage systems and functions;
- to fund the maintenance regime at an appropriate level, driven by the asset management plan;

- one way of organising the maintenance funding is to create a ring-fenced sinking fund. The UN may find this approach more suitable in the future as a way of protecting its assets from the effects of uninformed cost-cutting; and
- to develop in-house capability to develop an asset management strategy and associated maintenance investment plan.

Best practice considerations

As soon as a property asset is created it begins degrading. All buildings face this inexorable deterioration and the challenge is to judge the timing and quantum of the maintenance investment necessary to maintain the asset's fitness for occupancy.

For any asset owner the asset management plan is a vital tool. It sets out the lifecycle objectives for each asset, including its expected longevity, predicted use and its investment profile over time. Key to any asset management plan is having comprehensive data such as construction drawings and maintenance histories. Asset managers can reap long-term benefits for their organisation by recording all repairs or maintenance in a single source, along with the construction design plans.

The facilities management industry describes four broad approaches to maintaining assets.[2] All require investment.

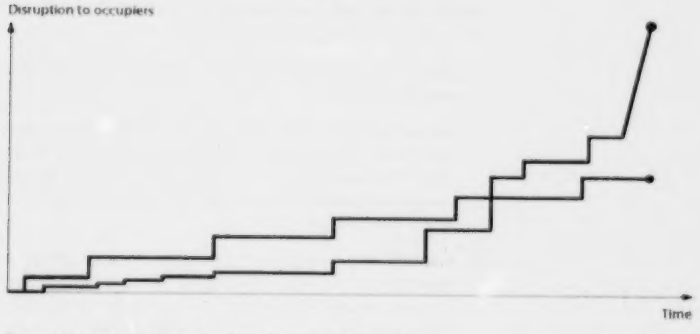
- **Run to Fail (RTF)** – the asset owner waits for plant, machinery and the building fabric to fail and then fixes it. The asset owner adopts a reactive strategy and fixes and repairs faults and defects as they arise. As time passes, the cost of keeping the asset operational increases, as does the inconvenience from the unexpected and increasingly severe interruptions.
- **Planned** – the asset owner maintains the plant, equipment and building fabric to a schedule. This involves putting a predetermined replacement and maintenance regime in place at the start. Some say this leads to a more expensive whole-life solution, as the owner replaces plant and equipment before it fails.
- **Predictive or Condition-Based Maintenance** – the owner checks on the condition of the plant and equipment for signs that it might need maintenance – using vibration testing and such like, often done via remote monitoring. This requires a sophisticated approach, delivered by highly skilled resources. Many argue that this technique produces best value.
- **Business-Focussed Maintenance** – combines all three of the above strategies. Each asset is considered on its importance to business continuity, its replacement lead times, on mitigation options (for example, whether standby generators can be hired) and on user or operational impact.

2 For an overview of how the industry works see, for example, the website for the British Institute of Facilities Management: www.bifm.org.uk/bifm/about/facilities

Aside from deciding on how and when to invest in a maintenance regime, an asset owner often has opportunities to commission further capital investments. Scanning the supplier market, an asset owner can often find investment options that would reduce whole-life running costs, or simply replace outmoded plant that requires specialist labour or bespoke spare parts that have long lead times.

Over time, a reactive maintenance strategy coupled with under-investment will result in degradation of the asset, in terms of statutory compliance, reliability and all-round user experience. As time passes, the occupiers of a building that is managed in this way will experience a progressively worsening situation, with the asset degrading and the frequency and intensity of the remedial works increasing. At some point the building becomes unusable, requiring either total refurbishment or demolition and reconstruction (**Figure 1**).

Figure 1
Reactive versus planned preventative maintenance



- Planned preventative maintenance, with ongoing asset investment.
- Reactive maintenance/(patch and mend). Leading to eventual obsolescence followed by major asset renovation/refurbishment.

Source: Board of Auditors

Case example
The International Criminal Court is under construction in The Hague. On completion it will follow a planned maintenance regime, with a 'ring-fenced 'sinking fund' to pay for the cost of the predicted maintenance effort over the asset lifetime. The aim is to avoid asset degradation and ensure funding continuity in line with whole lifecycle replacement demands.

Theme 2: Getting the best possible start

The CMP had a hesitant start, originating in the late 1990s when the need for the refurbishment programme gradually became apparent. A series of relatively broad-brush cost estimates and outline plans were met with resistance, challenge and delays; the project suffered both from a lack of sponsorship and low momentum in these early years and from the resignation of the original project director.

The CMP eventually got the go-ahead in 2007, after a change of pace that came with the newly appointed project director. What became known as the 'Accelerated Strategy' (intending to save two years off the previous strategy and take advantage of available space in the Manhattan office rental market to facilitate temporary swing space for staff) was accepted as the approved time schedule. Despite the change of pace, the CMP even then did not get off to a good start, for several reasons.

1 **The business case did not articulate any benefits that were particularly compelling or measurable.** The case was presented primarily as a 'fix and replace' argument, although some energy savings were identified from introducing new technology. The main prize, one of moving to a desk-sharing layout, which would have greatly increased occupancy densities and saved significant rental costs around New York and created opportunities for new and potentially more productive ways of working, was not recognised as an opportunity in the business case and was not even part of the remit.

2 **The Administration did not establish an external independent peer review assurance process.** An architectural advisory panel helped provide a sounding board to the CMP mainly on the heritage, artwork and aesthetic or iconic building features which was useful. But there was no source of constructive independent challenge regarding the project management arrangements, progress, costs, risks and issues. The lack of external constructive challenge was a weakness exacerbated by the absence of a corporate-wide portfolio and programme management approach – it was not even possible to organise peer review support from similar projects because the central capability did not exist.

3 **The governance arrangements were weak**, as described in Theme 3 below. As such, early warning signs about cost over-runs and schedule delays were not picked up and acted upon effectively by the Administration.

4 **There were weaknesses in the risk assessment approaches and cost forecasting techniques** (see Themes 6 and 7 below). The approach to risk management and cost forecasting for the CMP relied, too heavily in the Board's view, on the expert judgements of the highly experienced project team, combined with a formulaic approach to forecasting the contingency cost, rather than on detailed risk-based analytical forecasts. This potential risk exposure might have been identified earlier had an external assurance regime been in place from the outset.

Further, the forecast costs were incomplete. The 'Associated Costs', as they became known, covering the costs of a collection of activities necessary to support the project, had not been identified. Nor were they directly under the management or budgetary control of the CMP project team. For example, additional security guards were necessary to maintain an effective security perimeter during construction; the budgetary responsibility for this resource, however, lay with the Department of Safety and Security.

The Associated Costs (some $140 million) went un-owned and unresolved throughout most of the life of the CMP project. The General Assembly instructed in 2009 that the CMP should absorb the costs within the existing budget but there was limited room to do this.

Overall, the CMP got off to a difficult start, a factor which was to influence its delivery at every stage.

Learning opportunities

- Deploy dedicated and experienced resources to assist major projects in their early stages.
- Make sure that the business case is robust and includes a full benefits case, a robust risk assessment and mitigation approach, a strong governance arrangement and a comprehensive cost forecast underpinning the budget.
- Establish an integrated project assurance approach, especially in the early formative stages of a project.

Best practice considerations

The start of a project, when the biggest decisions are made, represents the most vulnerable time in its lifecycle. It is often when the least information is known about risks, when resources are still thin on the ground, when there is little funding support or momentum behind the early steps and when the organisation has a relatively limited understanding of the nature, scale and aims of the project. It is a time when initial ideas can become entrenched without proper challenge and review.

Building core project resources quickly

Before an organisation recognises and funds a project, the early thinking is carried out mainly by visionary people working alongside other 'day job' duties. This is an inherently risky approach because it risks missing out options and narrowing down too quickly on a costly or inappropriate solution. A key to success is in deploying experienced resources to support those early exploratory stages.

Establishing a robust business case

It is very important to establish a well-thought-through business case. Typically, this will include a statement of the drivers/needs for the project, identifying options for fulfilling them, and appraisal of those possible options, covering schedule, full costs for the total scope, risks and benefits. It will include governance structures and resourcing solutions (internal and external).

Very often an organisation will require three business cases, developed over time. The Strategic Outline Business Case will cover the main strategic options. The Outline Business Case will appraise and evaluate the front running options and consider matters such as the procurement strategy and the delivery schedule in more depth. The Full Business Case will contain robust cost estimates, and full lists of the project benefits, cash flow forecasts, risks logs and their mitigations, and a robust implementation plan. Each stage in this process provides an opportunity to revisit, develop and hone the assumptions, benefits, schedules, and most importantly the risks, their costs and mitigations.

Obtaining external assurance

In the early stages of a project there will be a high level of uncertainty and a wide range of potential solutions to explore. Obtaining external independent expert assurance about the emerging solution, before the business case develops, is a wise precaution. It gives those managing the project, and those involved in its governance processes, reassurance that all is well or early warning if it is not. It is important to note that neither the work of internal or external auditors is a substitute for an expert integrated assurance process. Numerous governments and professional project management organisations have implemented external independent assurance regimes over recent years.[3]

Theme 3: Governance, controls and assurance

The broad governance context

The CMP project fitted into and was delivered within the normal governance framework that applies to all UN projects, comprising the General Assembly, supported and informed by the Fifth Committee and by the Advisory Committee on Administrative and Budgetary Questions (ACABQ).

The CMP provided an annual progress report to the General Assembly and quarterly briefings to the Fifth Committee, the ACABQ and the United Nations Management Committee on the progress and cost of the project. The CMP project director also provided weekly updates on the project for the Executive Management Group chaired by the Under-Secretary-General for Management.

The CMP project was subject to regular review by the Office of Internal Oversight Services, who examined risks and controls at intervals throughout the life of the project, and an annual review by the Board of Auditors, who examined the financial statements, risks and forecasts, and other managerial issues, across the project.

3 A selection of illustrative examples of approaches to project assurance:
Association of Project Managers, A Guide to Integrated Assurance.
Australian government, Department of Finance and Deregulation, Assurance Review Process.
Government of New Zealand, Major Projects Assurance Group.
UK government Major Projects Authority.
Government of Norway, A regime for external Quality Assurance of Major Public Projects.
Canadian government Project Assurance Process.

Governance and the CMP

In practice, the executive control of the project, and the heart of the decision-making, lay with the Under-Secretary-General for Management and the director of the CMP. Together, they directed and prioritised the day-to-day delivery of the project design teams, cost consultants and construction suppliers working with the support of the Construction Manager.

Two advisory boards/committees provided further useful support. The Executive Management Group chaired by the project director enabled co-ordination between the various relevant groups such as the Facilities Management Service, Security, and Human Resources. This was a help to communications generally. A separate Advisory Board also helped by providing input on the aesthetic, historical context and architectural aspects of the project.

A major weakness in the governance arrangements, however, was the absence from the outset of a project board (or steering committee) to inform, advise and constructively challenge the project director in real-time. The corporate governance arrangements revolved around the annual cycle of the General Assembly and its supporting committees.

The business case, as mentioned earlier, gave a poor basis for prioritising trade-offs between cost, time and scope objectives. The weakness in the business case created a governance challenge because, lacking clarity on financial benefits or on occupancy efficiencies, the CMP project was run as a refurbishment project, with cost containment as a major objective, rather than as a benefits-yielding project.[4]

Change control

Change control was a major challenge for the CMP team. As explained in more detail in Theme 5, the contract strategy adopted by the CMP team meant that the UN held the responsibility for managing the design processes (retaining that responsibility, which was a sound decision, then meant that it became vitally important for design drawings to be issued complete and on time) and for co-ordinating the activities of the various Guaranteed Maximum Price (GMP) contractors on site. The means by which the CMP team retained control was through a change order process. A change order provides a means of instructing a contractor to do something new or different to the work specified in the existing contract. As the design developed and evolved, and in some cases ran late, it became necessary for the CMP team to issue many thousands of change orders. A backlog developed in this process, meaning that the CMP team was not as sighted as it should have been on the cost implications, and that contractors were taking a long time to be paid.

A further challenge was in managing the appetite of staff to changes to floor layouts, to proposed relocation sequences and to the emerging design drawings. The CMP team learnt from its early interactions with occupiers during the move to the temporary accommodation around New York, implementing a much clearer set of rules for subsequent engagements.

4 See Theme 1: Getting the best possible start.

Independent assurance

Additionally, the UN did not have in place a policy for obtaining independent expert assurance on its projects or programmes. Other than ad-hoc external reviews, mainly to provide a second opinion on the cost forecasts, the CMP did not benefit from regular and integrated external technical, cost or project management assurance reviews. These are reviews provided by external experts (external to the project) and are not to be confused with the role played by technical experts working as part of the project team, or internal and external auditors.

With a weak benefits case, unclear accountabilities for benefits delivery and the long, time-consuming reporting cycles, the governance arrangements were a weakness all the way through the CMP project. Enormous trust, with plenty of reporting but in effect minimal corporate governance, was placed in the hands of the Under-Secretary-General for Management and the director of the CMP.

Learning opportunities

The main learning points are around the importance of distinguishing between processes that are in place for reporting purposes and processes that are in place for governance and effective decision-taking. On future projects, the UN would benefit by doing things differently in key areas:

- Streamlined, effective governance processes and effective, appropriate delegated authorities are essential for projects to achieve their desired costs, benefits, scope and time objectives. Typically, this would mean identifying:
  - a Senior Responsible Owner, SRO, accountable for the business case and benefits embedment; and
  - a project director responsible for delivering specific costs, time, scope and Benefits Outcomes.
- The SRO and project directors should be informed and advised by a project board. The role of the project board is to challenge the SRO and project director constructively and to provide support for the project as it endeavours to meet its aims. The membership of the project board would be determined by the circumstances of the project; for those with significant costs or carrying operational risk the board would include a senior member from Finance and from Facilities Management Service, together with a 'senior user' representative whose role is to coordinate, represent and communicate with users or occupiers.

- Establish independent assurance throughout the life of a project. Rather than relying on internal and external oversight as a source of objectivity and constructive challenge, the UN would benefit from establishing an integrated assurance approach. This was shown in Theme 2 to be particularly important in the early stages of a project. The aim is to support management and help them deliver strategically important and high-value programmes, not to add another layer of oversight. Adoption of a portfolio management approach spanning all the UN's capital programmes, and other major programmes, would enable a systemic assurance approach, with learning opportunities at key stages, for example:
  - project or major sub-project inception;
  - business case approval;
  - procurement decision;
  - handover/readiness for service; and
  - strategic and operational impact.

Best practice considerations

In most large, complex organisations projects, programmes and portfolios of activity are normally subject to robust stakeholder management, governance and controls, supported by a combination of internal and external assurance processes. The aim is to ensure clear accountability and responsibility for delivery and at the same time establish effective controls and limits to mitigate and manage risk without overly constraining progress.

A well-governed project typically features:

- a detailed Full Business Case, articulating the benefits, costs, scope and proposed approach;
- clearly defined project management roles and accountability;
- a project board – properly constituted and effective;
- appropriate mechanisms for change control;
- timely project reporting arrangements supporting an efficient transparent decision process; and
- effective integrated assurance over the whole life of the project.

The Full Business Case is an essential element of the governance framework, as described above in Theme 2.

An organisation usually identifies two key roles for the successful delivery of a project:

- **The Senior Responsible Owner** (SRO) develops, presents and owns the business case and is accountable for its benefits, defined in terms of outcomes (such as financial savings, increased capabilities or improved services). The SRO adopts a facilitative role with the organisation's senior management and stakeholders, becoming an advocate and champion for the project at the highest levels.
- **The Project Director** owns the delivery of the project, defined in terms of costs, scope, timescales and benefits. The project director adopts a strong delivery focus, making sure that the designers, suppliers and operators are coordinated and working consistently towards delivery of the four objectives.

Normally, the SRO has the support of a project board. The SRO remains at all times fully accountable for the delivery of the programme's benefits, scope, costs and schedule and a properly empowered board can be a strong source of guidance, constructive challenge and support.

Effective change control is essential. Changes are a common feature of major projects and programmes. Keeping them under control from the moment they are suggested, then instructed and later quantified and reported is an essential discipline, adhering to delegated powers vested in the SRO and project director.

Timely, accurate, transparent and clear progress and cost reporting are essential features on any major project. Reports should be written to inform and promote effective decision-making by the project director, by the SRO supported by the project board, and by more senior members of the organisation depending on the levels of delegated authority, and ultimately those responsible for governing or funding the organisation. Project reports should also include forecasts of the costs of future risks which, when they materialise, will subsequently reveal themselves as change orders.

As noted in Theme 2 above, independent integrated assurance is a valuable tool in the governance process. Typically, an assurance review is carried out at key stages in the life of the project, for example at the outset to validate the need and the strategic approach; after drafting the business plan and before proceeding with procurement; during delivery and before handover; soon after handover, confirming contractual completeness; and finally a few years after handover, to assess the operational and strategic success.

Case example

The London 2012 Olympic Games programme is an exemplar in transparent open access reporting. The 2012 team made project information available 'live time' in a data room to the governing body, the client sponsor, the government and external audit organisations. Making the project information available in this way greatly improved transparency, knowledge and insight as the London 2012 Games progressed. All of the best practice from the London 2012 Games can be found at http://learninglegacy.independent.gov.uk/

Theme 4: Roles within a programme lifecycle

The UN invested in a relatively small project team to run the CMP project, around 20–30 people. Recognising that the UN did not have an organisation-wide cadre of resource with similar experience at its disposal to draw upon, the UN supported the core UN CMP team with external resources.

- An external cost consultancy company was appointed to provide risk management and cost management support. The cost consultancy was responsible for reporting actual and forecast costs – not only the core costs of each construction package, but also the costs of all change orders and of any claims made for additional payment due to disruption.
- A construction company was appointed to lead and manage all of the construction activities. The construction company was already familiar with the New York construction market and used its expertise, knowledge, authority and reputation to manage costs and to drive progress with the suppliers.

The responsibility for delivery of the whole CMP project rested with this small core team of people. Within the team, roles were established to suit the nature of the project, for example:

- engaging with the users about floor layouts and space allocations;
- managing the design team, particularly to ensure design coherency and timely delivery;
- managing construction;
- managing progress on each of the main buildings across the campus;
- finance and funding management;
- procurement;
- legal;
- reporting; and
- commissioning.

In practice, this approach worked reasonably well, although the small core team had little flexibility to grow or shrink in line with the workload, due to the inertia of the UN's recruitment and redeployment processes. Instead, the team was able to cope with peaks and troughs by drawing on resources from the cost consultancy and the construction company to help with the various phases.

With hindsight, however, there were some challenges that the team struggled to address. For example, the effort put into the initial user consultation process was not sufficiently intense to create genuine engagement or authoritative direction when required and the early migrations into the temporary swing space proved difficult.

Design management was a constant challenge for the CMP team. Significant percentages of the buildings across the campus were occupied by staff during the time when the initial design was being carried out. As such, the designers had to rely on assumptions supported by limited data about the true nature of the underlying structures. Only when the buildings were fully vacated could full information be derived. This inevitable delay put pressure on the design process, as did the challenge of coordinating the design across the various packages of work.

There was considerable advantage in retaining most of the responsibility for design management, but it also exposed the CMP to a high level of risk, as described in Theme 5 below. In hindsight, the CMP underestimated the challenge that would come from the design coordination process and from ensuring that the emerging design kept pace with the need for information from the construction process. Consequently, contract packages went out to competition in the construction market with designs less developed than they should have been, exposing the UN to risk from subsequent changes.

Another area where, with hindsight, matters should have proceeded differently was in the engagement with the Facilities Management Service (FMS). As already discussed, the UN does not have an overarching approach to asset management.[5] Early interactions with FMS informed the specification for the refurbished building, but with hindsight that level of engagement was too light. FMS should have been engaged more deeply at the outset and more purposefully throughout the life of the CMP. At a practical level, this resulted in a weakness in the readiness for handover, with FMS struggling to manage the assets or support them with appropriate supply chain contracts. At a strategic level, it meant there was little fit between the immediate post-completion support activities and the absent long-term asset management plan.

A strong positive feature of the CMP project was the way the management from the core project team, the construction company and the external cost consultant were co-located. This enabled rapid communications and issue resolution. It created a feeling of common purpose and single-mindedness, which was a great help in delivering the CMP project. The external designers, however, did not co-locate in this manner, which was a drawback. Ideally, all the main elements of the project team, irrespective of their corporate identities, should co-locate.

5 See Theme 6 (facilities management and organizational capacity).

Learning opportunities

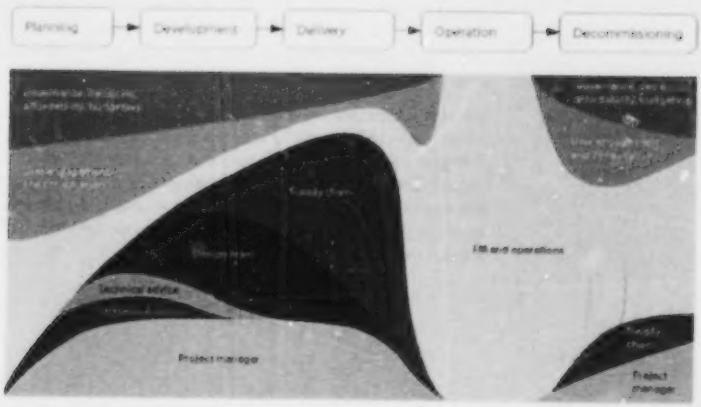
The main lesson learnt on the CMP project is in recognising how the roles of the project team inevitably have to vary as time passes on a project and that a high degree of flexibility will be required in terms of ensuring an appropriate resourcing strategy. In particular, it is important to:

- establish an integrated and, as far as possible, co-located team;
- create an effective user consultation process. The key to success lies in establishing an effective project board, which will include a 'senior user' with a strong consultative and communications remit;
- manage the design teams robustly, so as to ensure effective design coordination between contract packages and timely delivery of design drawings and specifications; and
- ensure that the Facilities Management solutions are embedded from the outset, firstly to ensure compatibility with the long-term asset management plan and secondly to ensure that the handover process is robustly supported.

Best practice considerations

The level of activity and focus of those contributing to a project varies enormously with time as projects move through the various phases from start to finish, as indicated in **Figure 2**.

Figure 2
Relative roles during a project's life



Source: Consents partners

In the early stages the initial concepts are often managed and developed by a small core team, carrying out consultations with the occupiers, users and maintenance groups about the project's scope and requirements. As time passes the project team, led by the project director, will grow and strengthen in line with the increasing workload required to prove the initial design concepts and prepare full business cases.

Once the organisation has approved the business case, the number of people working on the project usually swells significantly. Designers and constructors come on board through formal procurement channels, while the degree of interaction with the users abates as the majority of the effort switches to delivery. Towards the end of construction the size of the site workforce begins to diminish and the users or occupiers become more engaged again, especially those teams responsible for maintaining the asset.

Following what is normally a long operational period, the asset may eventually have to be demolished and cleared away or replaced, in which case further engagement activities start up again with the formation of a project team and the procurement of suppliers to carry out the necessary demolition works.

To be at best practice in this area means being ahead of the game in terms of resourcing, and having the right people in place ahead of time, being able to cope with the ebbs and flows of the demands of the project as it moves through its different phases. This therefore requires good planning and anticipation and it requires a flexible resourcing model through which the project team can access the right sort of resources at the right times.

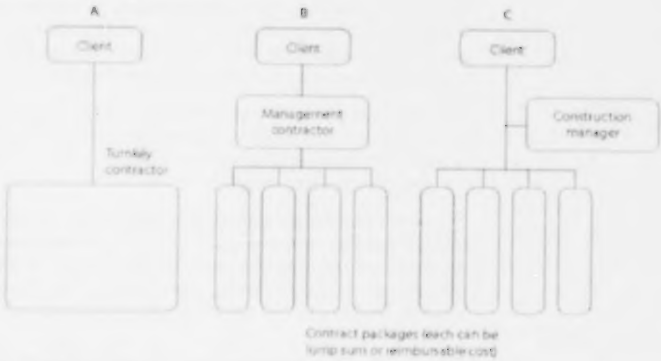
Theme 5: Commercial and procurement strategies

The CMP team recognised very early on that the full scope of the whole campus renovation project was not predictable at the outset. It was impossible to know what the whole design solution would be at that stage, because the condition of the assets could not be determined without stripping away the existing fit-out and inspecting the whole structure in an unencumbered condition. This insight proved right as in due course substantial volumes of asbestos were removed from the campus buildings, which demanded both care and time, and structural reinforcement was required in some areas, which could not have been foreseen. Higher standards of structural security emerged during the project lifetime too – imposing a major upheaval in terms of the design solution and schedule progression. The success of the whole project was destined to depend on the CMP team having flexibility in its contractual mechanisms to cope with substantial levels of change as time passed.

As such, this ruled out a lump sum/fixed price/turnkey solution because the level of uncertainty was too high; to attempt such a solution would have required the UN to agree to a significant risk premium in the contract price – assuming that a contractor could be found in the construction market in the first place willing to take on that level of risk and participate in such a deal.

After careful consideration the CMP project team elected to appoint a lead contractor organisation to work under a direct contract with the UN to procure and manage smaller contract packages, following Option B shown in **Figure 3**. The lead contractor received a management fee for its services in addition to direct cost reimbursement.

Figure 3
Contrast strategy options



Source: Board of Auditors

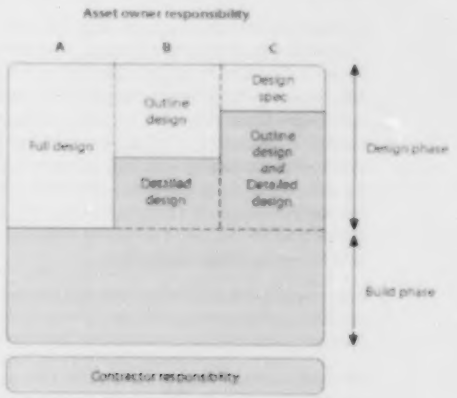
This package management approach created flexibility for the UN as the CMP team could make progress on a more local basis without knowing what the full solution was. For example, work could start on reconfiguring the basements as an early package of work, without knowing what all the design answers were in the three buildings above.

The CMP team, supported by its lead contractor, ran competitions in the global construction market to identify other contractors who could deliver defined packages of work under Guaranteed Maximum Price contracts. When tendering for such work the bidders provided:

- firm prices for work that could be fully defined; and
- schedules of cost rates for other work that was thought necessary but which could not be fully defined at that stage. The schedules of cost rates were subsequently used to calculate the costs when the design solution or specification later emerged.

The CMP team faced early on a key decision about how to organise and manage the design process for delivery of the project. Traditionally, there are three broad options, which are shown in **Figure 4** below. Option A means that the client team has responsibility for developing the full design, whereas at the other end of the scale under option C the client merely produces a design specification and then the contractor completes the design. There are benefits and disadvantages either way with any of the three routes shown in Figure 4 – towards option A the client has the advantage of retaining full control of the design, but loses the opportunity for contractors to innovate and take responsibility for design coordination. Towards option C the reverse opposite occurs – minimal ability for the client to influence the design but maximum contractor innovation and design coordination responsibilities.

Figure 4
Different ways of organising design responsibilities



Source: Concerto partners

After careful consideration, the CMP team chose a solution closer to Option A in the diagram above, namely to keep control of the design and to retain responsibility for design management. Teams of designers worked under the direction of the CMP team, supported by the external cost consultancy, which also took on a design project management role as the CMP project progressed.

This was highly advantageous, given that the design had to evolve and adapt at regular intervals as new information emerged about the condition of the asset. The approach carried significant responsibilities, however, as the CMP team had to ensure that the designs were properly coordinated between the packages, producing an integrated solution that joined up properly. It meant that the CMP team was responsible for ensuring that information was released on time, thus avoiding claims for delay or disruption. In reality, however, the CMP struggled to keep pace with the demands of the construction process and on several occasions packages were procured based on incomplete design information. This in turn created risks and meant that numerous (over 3,000 to date) change orders were required to clarify design details or to coordinate design information at package interfaces.

In selecting a GMP contract packaging approach led by a main contractor and in choosing to take full responsibility for the design, the CMP project positioned itself at the 'maximum control with maximum responsibility' end of the scale. Given the circumstances, with the high degree of change anticipated on the project, the two choices still make good sense in hindsight. It was, however, a contract strategy that left the UN exposed to the vast majority of risks arising on the project, from late design completion, inaccurate design and coordination between the package contractors. Where the CMP faced difficulties was in the execution of those strategies – with design management being a particular challenge. The design management process failed to keep pace with the construction schedule, and for that the CMP did carry the risk and in due course felt the consequences in terms of schedule delays and cost over-runs.

It will never be known whether setting a different contract strategy at the outset would have produced a different outcome, either in terms of preventing the delays which set in or in terms of preventing the cost-overruns, which became inevitable as the work progressed.

What was evident, however, was that the CMP team did face substantial logistical and coordination challenges in keeping the design on track. The construction process, once started, needed feeding with design information at the right rate in order to prevent delays setting in. A substantial backlog of change orders developed, meaning that the cost position was uncertain.

In hindsight, while the contract strategy was probably correctly configured to suit the phased delivery solution, the core team was inadequately resourced to maintain full oversight and timely control of the process.

Learning opportunities

There are substantial learning opportunities associated with the way the CMP team selected and then organised the contract strategy on the delivery of this major refurbishment contract.

- The choice of a 'packaged' contract strategy enabled work to progress when substantial parts of the scope were unclear or could not be determined at the time. This choice created a significant time advantage by allowing work to start in some areas before the full scope became known but it inevitably created risk for the UN as the total cost of the whole campus-wide refurbishment will not be known until the last contract package has been agreed. It also meant that the CMP team was responsible for the risks of poor coordination between packages.

- The contract strategy created a necessity for design management of the highest order. If the UN wishes to follow a similar contract strategy in the future, ie one based on multiple GMP contracts whose scope only crystallises as time passes, then the project team's design management capability must be excellent.

Best practice considerations

Selection of a commercial policy and strategy is one of the most important decisions an asset owner can make. This covers an organisation's funding arrangements for the project and its appetite to risk, to risk mitigation and incentivisation, and broadly how to go about keeping the project under control in order to deliver its stated benefits.

After that comes the procurement policy and strategy (how to shape the market and go about buying the required contract services). Within this overall process, a vital decision for the asset owner to make is the responsibility for management of the design.

It is important to consider each of these decisions explicitly, document them and obtain sign-off from the project board. The key decisions include:

The commercial policy and commercial strategy, including:

- funding;
- whole lifecycle cost management approach;
- risk management, mitigation and incentivisation; and
- lump sum v target cost v reimbursable commercial regimes.

The procurement policy and procurement strategy, including:

- market engagement; and
- contract packaging/bundling.

The design policy and the design strategy, including:

- the balance between client-retained and contractor-delivered design;
- market engagement approach and shaping; and
- design contract packaging/bundling.

Theme 6: Risk and contingency management

The concept of contingency cost forecasting and management is not one that sits comfortably in the United Nations, where the normal practice is to award contracts with low levels of contingency. On a project such as the CMP, with a wide range of uncertainty and facing significant scope, timing and technical risks from the outset, these established contingency working practices can quickly become a constraint that affects progress and pushes up cost unexpectedly. The UN's normal operating procedures do not support the concept of risk-based contingency management, nor of project-wide contingency management.

The CMP team therefore followed a simplistic approach to risk and contingency management both in the pre-tender phases and during the life of each GMP contract.

- Pre-tender, the budget for each GMP package included a blanket 20% contingency cost allowance.
- Once each GMP contract had been awarded the contingency allowance was set at 10% of the tender price.

This formulaic approach had an advantage of simplicity, but the fundamental disadvantage of masking the true forecast costs of the risks.

The few risk assessments that the CMP carried out did not drive the contingency cost calculations, rather they were self-contained and separate exercises. In the first few years of the CMP project these risk assessments were conducted at a detailed level once a year, with interim updates taking place every six months. Over time, the risk assessments were updated more often.

The Board of Auditors commented on this unsatisfactory position regularly as part of its annual audits of the CMP programme. The concerns were threefold:

- the simplistic application of contingency allowances bore no relationship to the potential levels of risk in each package;
- there was no formal programme-wide mechanism available to the CMP management team to retain contingency sums for programme-wide risks. There was no formal method to hold a contingency reserve above the GMP level, either managing surplus contingency or for reallocating it towards newly emerging risks; and
- the reporting of contingency lacked transparency. The levels of contingency, either used or remaining, were not separately reported, nor the reasons for its use.

In short, this resulted in the true position regarding risks and the potential for cost rises being unclear – certainly from an outside governance perspective as the cost forecast became increasingly hard to understand.

One of the risks that a long-running project will usually face is that of construction price inflation. Most projects make an explicit allowance for this risk in the financial cost forecasts. The CMP project correctly recognised this risk at the outset, reporting the quantum of the escalation allowance as it was called. As the project progressed, however, the escalation allowance was included with the remaining contingency allowance. The provision was eventually used, but without a clear justification being provided for the level at which it had been set, or for its use. It essentially was absorbed into the contingency as a whole.

The CMP's whole approach to contingency management, inflation provisions and risk provisions was unclear to member states throughout the life of the project.

Learning opportunities

The UN now has an opportunity to adopt a more systematic approach to risk management and contingency management. There would be benefits from:

- assessing risks and calculating their probable weighted cost impacts each month;
- basing the forecast contingency sum required for the remainder of the project on the quantified regular risk assessment and being aware that the forecast can rise or fall as time passes and risks reduce or increase, or new risks arise;
- explicitly stating the risk of price inflation, and the underlying assumptions, in the project budget, and reporting on this separately to donors, with the potential to return this funding to donors if not needed;
- modifying the corporate governance policy to enable contingency sums to be held at:
  - contract level under the direct delegated authority of the project director; and
  - project-wide level under the control of the SRO endorsed by the project board.

Best practice considerations

Modern best practice is for programmes and projects to be driven by their risk management processes, with the risk register and associated mitigating actions frequently updated and a clear link maintained between the **contents of the risk register** and **the expected costs should those risks arise**. Those expected costs, usually termed the contingency costs, comprise subcategories that often include:

- a cost allowance for the effects of inflation (which can be a material factor on a long-running project), separately justified and reported based on robust data;
- an allowance for the costs of foreseeable risks; and
- an allowance for the risks of unforeseeable risks.

The contingency cost allowance must be fundamentally linked to managing risk, with no assumption that it will all be used, an understanding that any unused contingency can be returned to funders, but at the same time available for use should a well-justified reason arise (a key task for a steering committee or project board would be to examine any justification put forward for use of the contingency). Accepting these principles drives a different way of managing and governing the contingency funding, rather than allowing it to be solely controlled and used by those directly managing the project. For example, GMP package-level contingency monies should be held and managed by those best able to manage risks on each GMP (ie the UN project manager); programme-wide contingency monies should be held by the programme director, with some pre-defined risks held at Programme Board level. In this way, with total transparency of risks at all levels, the mitigation responsibilities are placed with those best able to take informed action.

Risk management and mitigation accompanied by benefit maximisation should be at the centre of a project's management philosophy. All processes and priorities on a project should be directed to mitigating risk and maximising benefits. Modern risk management processes revolve around the project team assessing the risks and their impacts in terms of costs, benefits, schedule and scope or performance outcomes on a regular basis (usually monthly) from both a pre-mitigation and post-mitigation perspective.

The project team then calculates the likely impact of those combined risks based on the individual probability of their occurrence. The calculation method adopted can vary from simple tabular summation of the weighted probabilities through to sophisticated risk-modelling techniques using dedicated software. Pragmatic asset owners, supported by experienced project directors, often adopt the first approach rather than the second.

Having computed the net probable cost impact of all the known risks and having made an assessment of the cost of future as yet unknown risks, for example by benchmarking or by trend analysis, the project team will then reforecast the contingency cost allowance and use this information to update the project total forecast.

Theme 7: Cost, time and outcome forecasting

The Board of Auditors reviewed as part of its annual audit the CMP's approach to forecasting the total costs of the project, finding combinations of good practice and significant flaws.

What the CMP did well was to break the total scope of the job into smaller packages, procuring each one separately and reporting the costs accordingly. Each contract package procurement exercise was preceded by an independent cost forecast from the cost consultant, together with a higher-level cost estimate from the construction manager. The contractor's bids, when they were opened as part of the bidding process, were compared against these independent numbers. Anomalies were queried and clarifications issued. At the end of that process the CMP team, informed by the construction manager and by the cost consultant, had a good understanding of the tendered cost structures. This informed the forecast total cost for each GMP contract package. That part of the cost forecasting process matched good practice and was robust.

The weakness with the cost forecasting process was that, as described in Theme 6, the UN has a formulaic approach to forecasting the costs of risks, applying a 20% contingency cost allowance before a contract is awarded and a 10% allowance after award. Such a cost forecasting approach was flawed in that it was not based on the true estimated costs of the risks. The Board commented regularly on this forecasting weakness but the CMP team did not adopt a more comprehensive cost forecasting technique.

As a consequence of that approach, the total cost forecast would tend to remain relatively stable for long periods, with the 10% contingency sum being utilised as a source of funding for numerous change orders associated with design development and design coordination. Cost stability prevailed until a major risk materialised, at which point the cost forecast would be re-examined and a new figure reported to the General Assembly. In this way, the CMP's cost forecasts inevitably understated the true position and the life of the CMP project was punctuated by apparently unpredictable cost shocks.

A more informed approach to forecasting risks and to relating the costs of those risks to the total cost forecast would have given earlier warning to stakeholders about the true cost position and would have provided earlier opportunities to make trade-offs between the scope, time and cost objectives.

Learning opportunities

The formulaic approach to contingency management did not serve the UN well on the CMP project. The learning point is that contingency should be estimated from the ground up, based on an appreciation of risks and their probable cost impacts plus an allowance for unknown risks or costs derived from trend analysis or benchmarking.

The monthly cost forecasts should be genuine estimates of the total final cost of the project, based on all known information about the procured contracts, about future procurements, about change orders that have been agreed, about those that are known about but not yet agreed, and lastly about the forecast cost allowance for risks.

Best practice considerations

Most asset owners follow a common path when forecasting a project's costs. Typically, the anticipated final cost is arrived at by working from left to right across the table shown in **Figure 5**.

The anticipated final cost (shown in column F) is the sum of the costs of:

A The contracts awarded to date

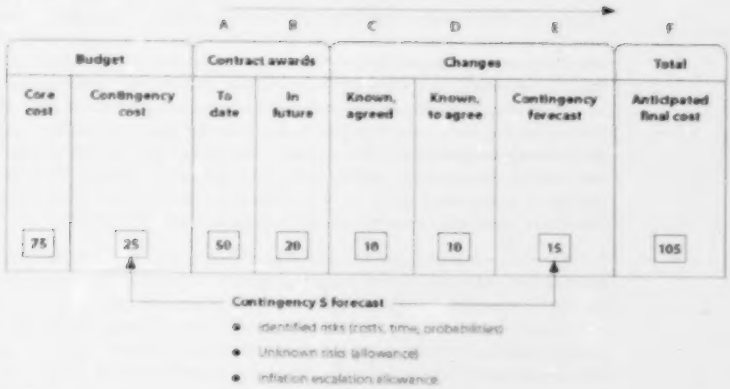
B The contracts expected to be awarded in the future

C The change orders instructed and agreed to date

D The changes orders instructed to date, awaiting confirmation of the scope or cost records

E A contingency cost forecast for future risks

Figure 5
Approach to cost forecasting



Source: Board of Auditors.

A and **C** represent costs that are certain – they are agreed and are part of the contract payment mechanism.

B and **D** represent costs that are less certain – typically, some information is available but the cost forecast will involve assumptions as well.

E is the least certain cost. It is usually derived from a risk analysis as described in Theme 6, supported by a cost estimate for remaining unknown risks, which can be derived by benchmarking, by trend analysis of the changes to date or by judgement.

Figure 5 contains an illustrative example – showing how the budget of $100 is forecast to be exceeded by $5 due to the forecast costs of future risks.

This philosophy and approach to forecasting the final costs is commonly accepted practice across most projects, although the presentation and format may vary from one asset owner to another.

Theme 8: Portfolio management and organisational capability

When the CMP was conceived the UN, despite having an extensive real estate portfolio, did not have a portfolio-wide management approach to planning or managing its global asset base. The practice at that time, in the late 90s, was for projects to emerge individually, to have their business cases assessed as one-offs and, after approval, to make progress on their own. This is an important point: working in isolation meant that the CMP could not benefit from or be supported by an already-established capability group or centre of excellence. There were also few existing standards and policies to draw from. Nor was there a cadre of project and programme managers potentially available for deployment onto the CMP project. The CMP was therefore delivered very much as a discrete project, not part of a coherent planned global portfolio of activity, and it was not supported by organization-wide estates management processes or resources, or any framework for the delivery of major projects.

The UN's response to this capability and capacity shortfall was to search the construction management market for suitably skilled and experienced people, recruiting them to lead the CMP on fixed-term contracts, supported where possible by internal administrative staff already employed by the UN. This approach had the advantage of enabling the UN to pick the best people for the senior roles from the market. It carried a major disadvantage, however, because the recruitment lead time was typically 12 months. The CMP lost momentum in its early stages when there was a change of project director and after that it was not easy to adjust upwards or downwards its resource profile when the workload and required capability demands changed. There was a risk of poor continuity throughout the project; there was no Plan B that would have coped with senior staff losses and there was inadequate corporate strength in depth.

Another disadvantage arising from the one-off approach taken by the UN was that there were no corporate occupancy standards in place for the quality of the fit-out, occupancy densities, standard office and floor layouts/specifications and so on. The CMP had to solve all of these challenges from scratch. The CMP in fact made a lot of progress considering those circumstances in standardizing the physical solutions (there are now far fewer office variants for senior staff and limited desk size choices for other staff) but, working without corporate guidance or structures, the CMP never managed to bring the UN anywhere close to international occupancy standards of space allocation, desk-sharing, home working and mobile working[a] had it done so, higher occupancy densities would have considerably reduced the requirement for temporary and long-term rental space elsewhere in New York. Achieving this would have entailed a wider change management remit, beyond the immediate scope and objectives of the CMP.

[a] For example, in the UK the space allocation per person is above 200 square feet, whereas in the US (given there it is between 120 to 150 square feet) with an established target of 90 to 100 square feet that departments are working towards.

Learning opportunities

There is a strong need for a corporate UN integrated portfolio management approach to asset management, with a central unit responsible for:

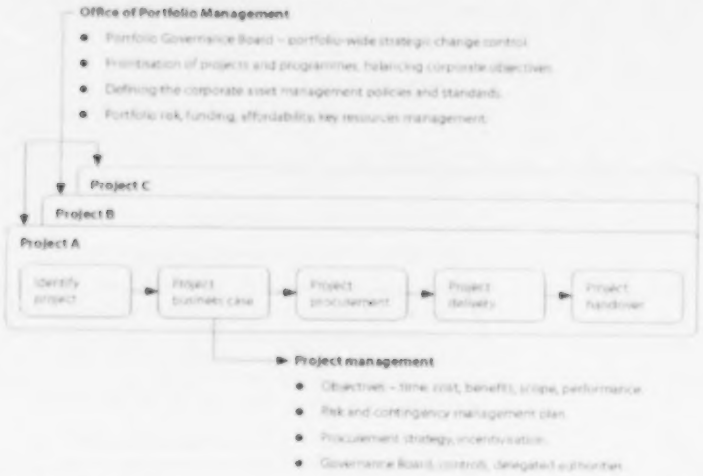
- Portfolio planning
- Policies and standards
- Business plan coordination, presentation and prioritisation
- Resource deployment onto key projects at project director-level and Project Management Office-level
- Sharing and promoting best practice
- Providing portfolio-wide estates and project management systems

Figure 6 overleaf shows how an Office of Portfolio Management (OPM) could work in the UN. It would interpret the UN's wider corporate strategy and would understand the operating environment and affordability constraints across the whole landscape. The OPM would be responsible for managing the competing tensions and priorities between projects and programmes across the whole of the UN, whatever the nature of the work, ranging from real estate projects to IT projects to business change programmes.

The OPM would ensure consistent policies and standards are in place across the UN. It would develop and implement new standards for asset management and other business areas where there is no current capability. In areas where consistent policies and standards already exist, which may be the case, for example in ICT, the OPM would only have to fulfil the portfolio prioritisation role.

Lessons from the United Nations Capital Master Plan

Figure 6
Adopting a portfolio planning approach


Office of Portfolio Management
Portfolio Governance Board – portfolio-wide strategic change control
Prioritisation of projects and programmes, balancing corporate objectives
Defining the corporate asset management policies and standards
Portfolio risk, funding, affordability, key resources management
Project C
Project B
Project A
Identify project
Project business case
Project procurement
Project delivery
Project handover
Project management
Objectives – time, cost, benefits, scope, performance
Risk and contingency management plan
Procurement strategy, incentivization
Governance Board, controls, delegated authorities

Source: Board of Auditors

Best practice considerations

Many organisations with large real estate portfolios establish a capability to coordinate and manage project, programme and portfolio activities across the entire estate. This enables the organisation to develop a cadre of talent that can deploy from one project to another, to adopt a consistent approach when delivering projects and programmes and, crucially, to define and maintain estate-wide standards for quality, brand identity, occupancy densities, maintenance investment and capital programme delivery. Typically, a portfolio asset management director will be responsible for:

1 setting policies and standards that apply across the whole estate;

2 leading and being accountable for integrated portfolio planning, budgeting and priority setting;

3 portfolio-wide resource management (for example, deployment of scarce resources);

4 learning, capability-building and best practice promotion;

5 establishing and maintaining organisation-wide asset management information systems and asset registers;

6 procuring services such as facilities support, communications networks, IT and construction delivery;

7 programme and project management of major investment in new or existing assets; and

8 acquisitions and disposals activity.

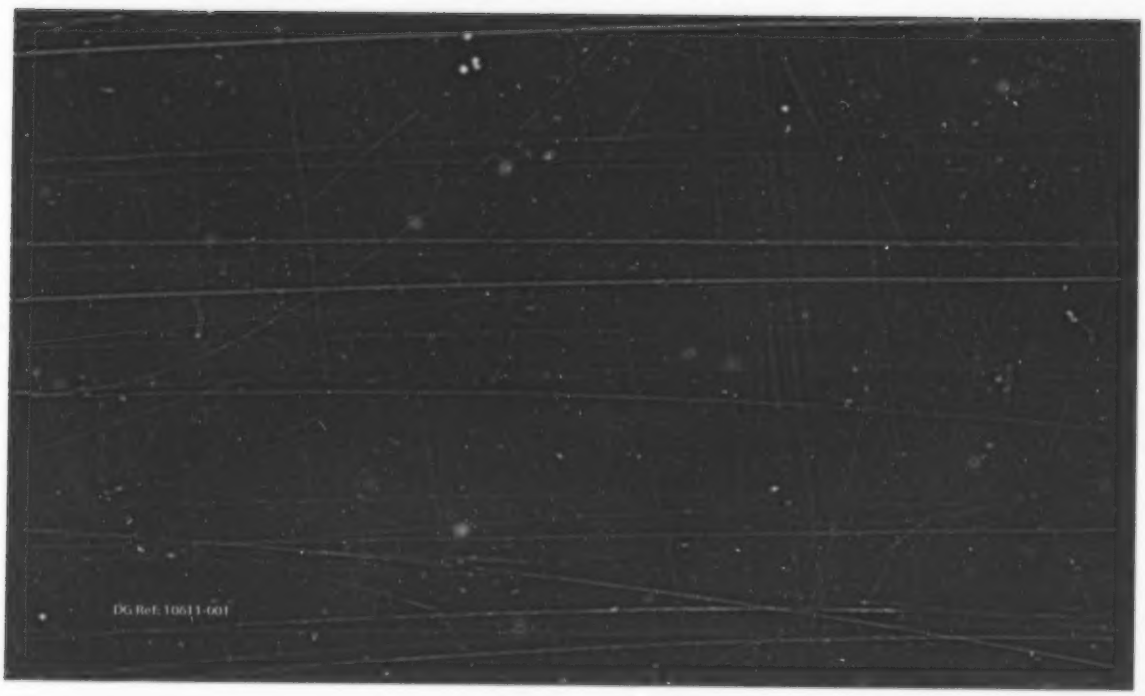
Depending on the physical spread of the estate, the central unit may choose to delegate or devolve certain activities to country-specific teams. The first six activities in the list above are often the direct responsibility of the centralised function, with project and programme management delivery, depending on project workload, often devolved to the relevant countries.

Case example

A national Foreign Ministry has properties in many countries around the world.

It has implemented a global portfolio management approach. Its rolling ten year portfolio plan is informed by asset condition surveys, by government policy changes and by user requirements.

The ministry's Estates and Security Division prioritises and organises work across the global asset base and is responsible for policies, standards, and budget and resource prioritisation. Projects and programmes, once approved by the corporate centre, are either delivered locally or by the central estates team.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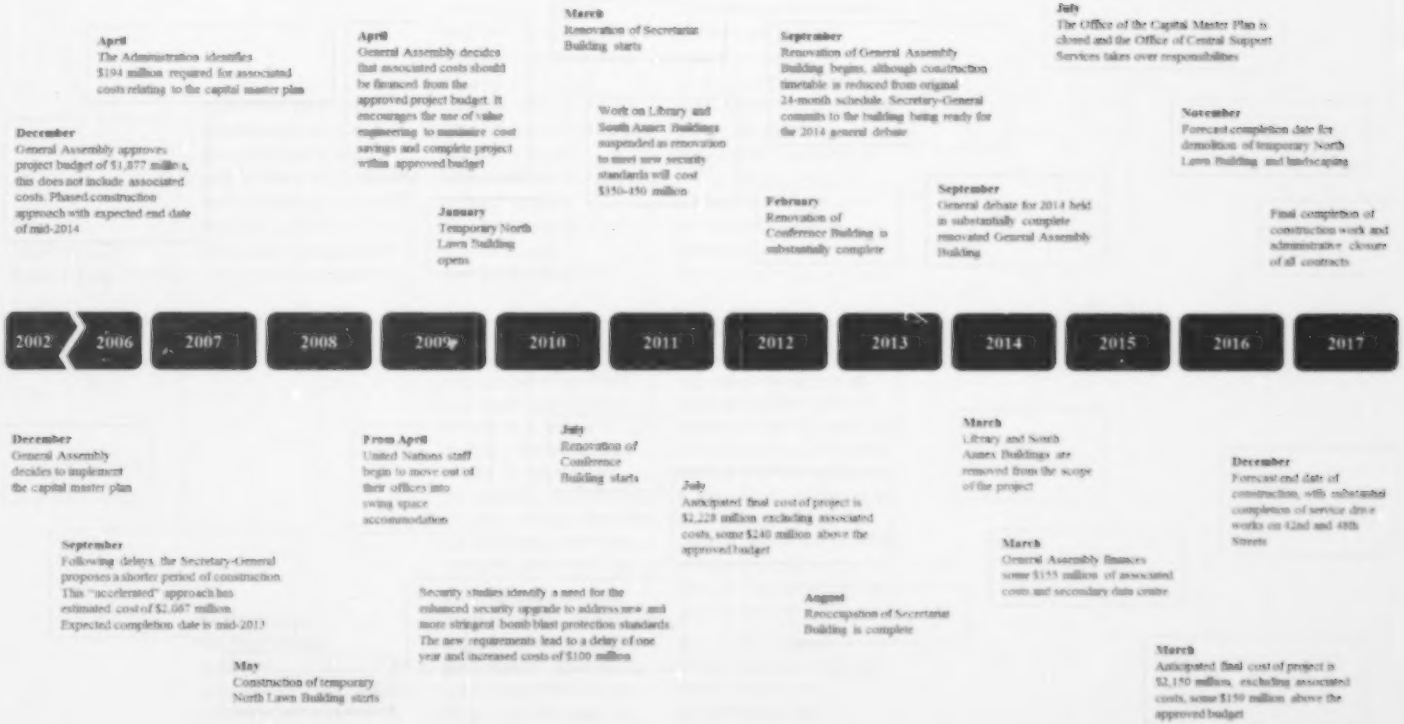
Annex II

Timeline of key events in the capital master plan as at March 2016


April
The Administration identifies $194 million required for associated costs relating to the capital master plan
December
General Assembly approves project budget of $1,877 million; this does not include associated costs. Phased construction approach with expected end date of mid-2014
April
General Assembly decides that associated costs should be financed from the approved project budget. It encourages the use of value engineering to maximize cost savings and complete project within approved budget
January
Temporary North Lawn Building opens
March
Renovation of Secretariat Building starts
Work on Library and South Annex Buildings suspended as renovation to meet new security standards will cost $350-450 million
September
Renovation of General Assembly Building begins, although construction timetable is reduced from original 24-month schedule. Secretary-General commits to the building being ready for the 2014 general debate
February
Renovation of Conference Building is substantially complete
September
General debate for 2014 held in substantially complete renovated General Assembly Building
July
The Office of the Capital Master Plan is closed and the Office of Central Support Services takes over responsibilities
November
Forecast completion date for demolition of temporary North Lawn Building and landscaping
Final completion of construction work and administrative closure of all contracts
2002
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
December
General Assembly decides to implement the capital master plan
September
Following delays, the Secretary-General proposes a shorter period of construction. This "accelerated" approach has estimated cost of $2,087 million. Expected completion date is mid-2013
From April
United Nations staff begin to move out of their offices into swing space accommodation
May
Construction of temporary North Lawn Building starts
Security studies identify a need for the enhanced security upgrade to address new and more stringent bomb blast protection standards. The new requirements lead to a delay of one year and increased costs of $100 million
July
Renovation of Conference Building starts
July
Anticipated final cost of project is $2,228 million excluding associated costs, some $240 million above the approved budget
August
Reoccupation of Secretariat Building is complete
March
Library and South Annex Buildings are removed from the scope of the project
March
General Assembly finances some $155 million of associated costs and secondary data centre
December
Forecast end date of construction, with substantial completion of service drive works on 42nd and 48th Streets
March
Anticipated final cost of project is $2,150 million, excluding associated costs, some $150 million above the approved budget

Annex III

Status of implementation of recommendations

General Assembly session/paragraph	*Summary of recommendation*	*Administration's comments on status, March 2016*	*Board's comments on status, March 2016*	*Fully implemented*	*Under implementation*	*Not implemented*	*Overtaken by events*	*Closed by the Board*
Sixty-eighth session/ paragraph 39	The Board recommends that for future projects of this nature the Administration develop a risk-based approach to determining, allocating and reporting contingency funds on best practice in modern project management.	Refer to the report of the Secretary-General on the strategic heritage plan of the United Nations Office at Geneva (A/69/417, paras. 118 and 119). A risk-based approach to determining, allocating and reporting contingency funds is being used for the strategic heritage plan. That has been actioned. It was explicitly reflected in the most recent report on the strategic heritage plan, as part of the internal control framework and governance structure. The principles will likewise apply to other ongoing capital projects.	The Board notes that the programme management guidelines for capital projects outline a standard approach for risk management and quantification of contingency for projects above $20 million. The guidelines do not yet have the formal status to enable the Office of Central Support Services to enforce projects adopting this approach for determining contingency on a risk-based approach. However, an approach has been developed and on this basis the Board considers this recommendation implemented.	X				
Sixty-eighth session/ paragraph 77	The Board recommends that the Administration adopt a whole life cycle asset investment strategy and assess costed options for the through-life maintenance of the Headquarters buildings.	The Administration considers this recommendation under implementation. Following the issuance of the report of the Secretary-General on the strategic capital review (A/70/697), which included a comparative analysis of a reactive versus a life cycle replacement approach to capital maintenance, the General Assembly, in its resolution 70/248 B,	The Board notes progress made through performing the strategic capital review, which is a first step to improving the information available to better understand maintenance requirements of Headquarters. The report for 2014 has showed the cost of preventative maintenance versus reactive maintenance. As yet, there are no budget plans for long-term maintenance.		X			

General Assembly session paragraph	*Summary of recommendation*	*Administration's comments on status, March 2016*	*Board's comments on status, March 2016*	*Fully implemented*	*Under implementation*	*Not implemented*	*Overtaken by events*	*Closed by the Board*
		requested that more detailed information on the potential costs and benefits of a life cycle replacement approach be presented in future reports of the Secretary-General on the strategic capital review. Subject to further study, the Secretary-General intends to submit the next report at the seventy-second session of the General Assembly.	The Board therefore considers this recommendation under implementation.					
Sixty-eighth session/ paragraph 82	The Board recommends that the Office of Central Support Services review its ongoing maintenance contracts, based on an assessment of the total scope of facilities management requirements after completion of the capital master plan, and assess the possibilities for obtaining better value from any future strategic commercial relationship.	The Administration considers that this recommendation has been superseded by recommendation 17 (d) for the 2015 period, to which the Administration agreed and advised that it will engage in an independent review of maintenance practices at the end of 2017 after 12 months of maintenance data in the Plant Maintenance module of Umoja.	The Administration is still committed to undertaking an independent assessment of its maintenance approach, although this is likely to be undertaken a year later than initially planned, in late 2017. Recommendation 17 (d) of the Board's report for 2015 is not a replacement for this recommendation. This recommendation is therefore under implementation.		X			
Sixty-ninth session/ paragraph 25 (b)	Apply independent project assurance to all major projects. There is currently no established approach to providing independent project assurance in the United Nations.	The Administration considers this recommendation implemented. The question of independent assurance is addressed in the construction project guidelines promulgated by the Office of Central Support Services and will be taken into account in the governance structure	The Board reiterates its previous response. There remains no established approach to provide independent assurance to all major projects in the United Nations. While recognizing the development of construction guidelines, the Board has seen no evidence that the			X		

General Assembly session paragraph	*Summary of recommendation*	*Administration's comments on status, March 2016*	*Board's comments on status, March 2016*	*Fully implemented*	*Under implementation*	*Not implemented*	*Overtaken by events*	*Closed by the Board*
		of all future major capital projects for the consideration and decision of the General Assembly.	Administration has in place the skills and resources to apply independent project assurance to all major projects. This recommendation is not implemented.					
Sixty-ninth session/ paragraph 25 (c)	Review maintenance arrangements on the basis of the operating data with respect to new assets currently being collected and assess possibilities for obtaining better value for money for the Administration's requirements. As previously recommended, it is important to gather operating data about new assets, such as energy consumption, maintenance patterns and the skills required for the servicing of plant and equipment, so that contractors can bid on an informed basis. This should provide the Administration with a clearer view of its overall maintenance requirements	The Administration considers this recommendation implemented. The Office of Central Support Services is committed to ensuring that the new data will be used to improve the maintenance activities, and that such responsibilities are being performed adequately and effectively. The Office has developed a planned and preventative maintenance plan for installed equipment at Headquarters. This was developed on the basis of recommended equipment maintenance schedules provided by Syska Hennessy and is currently being maintained at the local level by the responsible shop foremen (or contractor, where applicable). This information is being added to the Umoja Plant Maintenance module, where completion can be tracked electronically and with greater transparency. There is a detailed written procedure for each preventative maintenance action.	The findings in section E of the Board's report for 2015 demonstrate that positive progress has been made, and while the Administration needs to continue to assess maintenance arrangements on the basis of operating data, the Board considers this recommendation implemented, but has raised a related recommendation in its report for 2015.	X				

General Assembly session paragraph	*Summary of recommendation*	*Administration's comments on status, March 2016*	*Board's comments on status, March 2016*	*Fully implemented*	*Under implementation*	*Not implemented*	*Overtaken by events*	*Closed by the Board*
Sixty-ninth session/ paragraph 25 (d)	Commit to visible senior management leadership on the flexible workplace project. Experience suggests that, like all change initiatives that have an impact on the day-to-day working environment, senior management leading by example will be vital in gaining staff buy-in and securing the intended benefits.	The Office of Central Support Services continues with a successful engagement with senior leadership within the Organization. Further progress depends on a positive decision of Member States during the main part of the seventy-first session of the General Assembly to fund the implementation of flexible workplace.	The Under-Secretary-General for Management and the Assistant Secretary-General for Central Support Services have been visible and active champions of flexible workplace. There is evidence, however, of resistance from other senior managers to implementing flexible workplace in their departments despite the well-received business case to do so. It remains important that senior management, including members of the Management Committee, lead by example and adopt new ways of working that are offered by the flexible workspace. The Board considers this recommendation under implementation.		X			
Seventieth session/ paragraph 17 (a)	Continuing to closely manage the remaining works to ensure delivery by December 2016 within the $49 million budget	The Administration is committed to ensuring close management of the remaining activities to achieve successful completion within schedule and budget. The management of the remaining activities is undertaken with the same diligence and scrutiny that have been engaged in the previous phases of the project. The Administration has continued to closely monitor and assess the	The Board notes in its report for 2015 problems in the delivery of the revised plan to complete the project. The Board closes its previous recommendation, which is superseded by a new recommendation in its report for 2015.					X

General Assembly session paragraph	*Summary of recommendation*	*Administration's comments on status, March 2016*	*Board's comments on status, March 2016*	*Fully implemented*	*Under implementation*	*Not implemented*	*Overtaken by events*	*Closed by the Board*
		project expenditures, progress and requirements on the basis of analysis of the updated status of the works. The envisaged costs are reviewed, monitored and adjusted on the basis of the accepted work and actual level of expenditures. The scope of work and the budget are adjusted to ensure that they are in line, ensuring the project is finalized within the existing approved budget. Contracts for activities not performed by the construction manager are awarded to vendors pursuant to a competitive public solicitation exercise and subject to the review and recommendations of the Headquarters Committee on Contracts (if needed). All costs are subject to high-level scrutiny, and all payments are made after thorough due diligence and verification undertaken through multiple layers of review in accordance with the Financial Regulations and Rules of the United Nations.					
Seventieth session/ paragraph 17 (b)	Managing and reporting that the project's outcomes have been delivered, including financial and non-financial benefits expected and achieved from the investment in the capital master plan.	The Administration will include additional information requested by Member States in the fourteenth annual progress report of the Secretary-General on the implementation of the capital master plan.	The thirteenth annual progress report of the Secretary-General provided the most comprehensive benefits statement to date. However, as the Advisory Committee on Administrative and		X			

General Assembly session paragraph	*Summary of recommendation*	*Administration's comments on status, March 2016*	*Board's comments on status, March 2016*	*Fully implemented*	*Under implementation*	*Not implemented*	*Overtaken by events*	*Closed by the Board*
			Budgetary Questions stated and the Board notes, more needs to be done in future to report actual performance. Section E of the Board's report for 2015 details benefits from the capital master plan. The Board therefore considers this recommendation under implementation.					
Seventieth session/ paragraph 17 (c)	Accelerating closure of the remaining capital master plan contracts to increase certainty regarding final project costs and to release any potential savings.	The Administration is committed to ensuring closure of the remaining contracts within schedule and budget. To the extent of any remaining uncommitted balances, they will be returned to Member States.	The Board notes that despite the Administration's efforts, there has been little progress in closing the contracts of the main contractor since it last reported. Furthermore, the claim raised by a subcontractor against the main contractor is having an impact across a number of contracts, and this could possibly delay financial close-out of these guaranteed maximum price contracts. The Board therefore considers this recommendation as not implemented.			X		

General Assembly session/ paragraph	*Summary of recommendation*	*Administration's comments on status, March 2016*	*Board's comments on status, March 2016*	*Fully implemented*	*Under implementation*	*Not implemented*	*Overtaken by events*	*Closed by the Board*
Seventieth session/ paragraph 17 (d)	Reporting the full amount of any savings arising from contract closure and introducing appropriate governance mechanisms to determine the use that can be made of such savings, including specific consideration of returning savings to Member States	Information on savings from the cancellation of prior year obligations is provided on a routine basis and will be included in the fourteenth annual progress report on the implementation of the capital master plan. To the extent of any remaining uncommitted balances, they will be returned to Member States.	The Board has seen no evidence of a governance mechanism or specific consideration of returning possible savings to Member States. This recommendation is not implemented			X		
Seventieth session/ paragraph 17 (e)	Applying wider learning from the capital master plan, including lessons documented in the Board's recent lessons-learned report, to future major projects	The Administration considers this recommendation implemented. The Office of Central Support Services published a comprehensive set of lessons learned from recent projects undertaken by the Organization, including the capital master plan, in the report of the Secretary-General on the strategic capital review (see A/69/760, annex II). In addition, the Office issued global guidelines for the management of construction projects in January 2016.	The programme management guidelines are a positive development in the delivery of capital projects. Although there is no specific reference to the Board's lessons-learned paper, the guidelines are good evidence of promulgating lessons learned. The Board's recent report on the strategic heritage plan also acknowledges that some of these lessons are being applied to that project. On this basis, the Board considers this recommendation implemented, but will assess whether future projects use the guidelines whenever it reviews a capital project.	X				
Total				3	4	3	0	1
Percentage				27	37	27	0	9

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